The Open House International Association (OHLA) aims to communicate, disseminate and exchange housing and planning information. The focus of this exchange is on tools, methods and processes which enable the various professional disciplines to understand the dynamics of housing and so contribute more effectively to it.

To achieve its aims, the OHLA organizes and co-ordinates a number of activities which include the Open House International seminar and an annual competition. The Association also acts as a clearing house and commercial aim of seeking to improve the quality of building through encouraging a greater sharing of decision-making by ordinary people and to help develop the necessary institutional frameworks which will support the local initiatives of people in the building process.

International Seminar/Workshop

To be held annually and hosted by a member institute. Exploring themes and the interlocking forms of public/private great relationships which are emerging in housing and settlement development.

The competition

To be sponsored annually, in connection with the Seminar. Covers principles, methods, tools and practice which may be transferable and interchangeable in evolutionary planning, needs-driven, housing and design. An international panel of judges selects the top submissions.

Aims

The Open House International Association (OHLA) aims to communicate, disseminate and exchange housing and planning information. The focus of this exchange is on tools, methods and processes which enable the various professional disciplines to understand the dynamics of housing and so contribute more effectively to it.

To achieve its aims, the OHLA organizes and co-ordinates a number of activities which include the Open House International seminar and an annual competition. The Association also acts as a clearing house and commercial aim of seeking to improve the quality of building through encouraging a greater sharing of decision-making by ordinary people and to help develop the necessary institutional frameworks which will support the local initiatives of people in the building process.
Contents

open house international  
September 2010

Editorial
Nicholas Wilkinson
5

SMART HOME SYSTEMS - ACCESSIBILITY AND TRUST
Greger Sandström & Ulf Keijer
6

THE CHANGES OF QUALITY IN JAVANESE HOUSES
Noor Cholis Idham, Ibrahim Numan & Munther Mohd
15

OVERALL QUALITY OF URBAN LIFE AND NEIGHBORHOOD SATISFACTION: A HOUSEHOLD SURVEY IN THE WALLED CITY OF FAMAGUSTA
Derya Oktay & Robert W. Marans
27

A USER REQUIREMENTS STUDY OF DIGITAL 3D MODELS FOR URBAN RENEWAL
Sisi Zlatanova, Laure Itard, Mahmud Shahrear Kibria & Machiel van Dorst
37

THE 'CLOSED/OPEN' DUALITY IN CONTEMPORARY URBAN FORM
Melinda Benko
47

SUSTAINABLE LOW-INCOME URBAN HOUSING IN VIETNAM: CONTEXT AND STRATEGIES
Iftekhar Ahmed, Jalel Sager & Le Vu Cuong
56

INTERACTION BETWEEN DESIGN STUDIO AND CURRICULUM COURSES: Bilkent University Case
Elif E. Turkkan, Inci Basa & Meltem O. Gurel
66

MEANS END CHAIN, PERSON ENVIRONMENT CONGRUENCE AND MASS HOUSING DESIGN
Mahmud Bin Mohd Jusan
76

INTER-DISCIPLINARITY IN URBAN DESIGN: ERASING BOUNDARIES BETWEEN ARCHITECTS AND PLANNERS IN URBAN DESIGN STUDIOS
Sujata Shetty & Andreas Luescher
87

NEXT ISSUE: CULTURE, SPACE and REVITALISATION: Strategies and Experiences of Urban Renewal and Transformation

Guest Editors: Dr. Hulya Turgut, Istanbul Technical University, Turkey - Prof. Dr. Rod Lawrence, University of Geneva, Switzerland - Dr. Peter Kellett, University of Newcastle upon Tyne, UK.

Open House International has been selected for coverage by EBSCO Publishing, the ELSEVIER Bibliographic Database Scopus and all products of THOMSON ISI index bases. SSCI, A&HCI, CC/S&B and CC/A&H. The journal is also listed on the following Architectural index lists: RIBA, ARCLIB, AVERY and EKISTICS. Open House International is online for subscribers and gives limited access for non-subscribers at www.openhouse-int.com
Previous Issues

vol. 35 no. 2
OPEN HOUSE INTERNATIONAL
Theme Issue: Perspectives in Sustainable and Healthy Housing.

Editorial
Evert Hasselaar
Teaching Environmental Sustainability to Higher Education Students: Some Reflections - Laure Itard & Maartje van den Bogaard
Sustainable Urban Renewal in Europe and the Netherlands - Frank Wassenberg
Community Strategies for Energy Efficiency, Successful Examples from Austria - Inge Strassl
Cooperative Refurbishment Inclusion of Occupants and Other Stakeholders in Sustainable Refurbishment Processes in Multi-floor Residential Buildings - Jürgen Suschek-Berger & Michael Ometzeder
Adoption of highly Energy-Efficient Renovation - Erwin Mlecnik
London Housing and Climate Change: Impact on Comfort and Health - A. Mavrogianni, M. Davies, P. Wilkinson & A. Pathan
Shifting the Focus from Defects to the Effect of Defects - David Ormandy
Socio-Environmental Dimensions in Outdoor Spaces of Contemporary Palestinian Housing - Muhammed Haj Hussein, Aline Barlet & Catherine Semidor

Guest Edited by Dr. Evert Hasselaar, OTB Research Institute of Delft University of Technology, The Netherlands.

vol. 35 no. 1
OPEN HOUSE INTERNATIONAL
Open Issue: Design Options, Housing Adaptation, User Evaluations, Spatial Qualities, Housing Sustainability, Open Building, Smart Home Systems, Architecture and Urban Design.

Editorial
Nicholas Wilkinson
Reducing Risk in a Changing Climate: Changing Paradigms toward Urban Pro-Poor Adaptation - Christine Warnet
A Theoretical Approach for Assessing Sustainability in Housing Environments - Beser Oktay Vehbi, Ercan Hoskara, Sebnem Onal Hoskara
Housing Adaptation for Adults with Autistic Spectrum Disorder - Magda Mostafa
Architects’ Design Options in Self Built Houses: Lessons From Bangladesh - Tareef Hayat Khan, Jia Beisi, Tapan Kumar Dhar
Users’ Evaluations of House Façades: Preference, Complexity and Impressiveness - Aysu Akalin, Kemal Yildirim, Christopher Wilson, Aysun Saylan
The Quarter: A Complex of Neighbourhood Units in Turkey - Ayhan Usta, Gulay K. Usta
Assessing Laguna District’s Spatial Qualities in Gazimagusa, Northern Cyprus - Mukaddes Fasli, Farnaz Pakdel

Guest Edited by Nicholas Wilkinson, Eastern Mediterranean University, Faculty of Architecture, Gazimagusa, Mersin 10, Turkey
Previous Issues

vol. 34 no. 4

OPEN HOUSE INTERNATIONAL
Open Issue: Incremental Self Build, Flexible Design, Housing Quality, Sustainable Housing Environments, Continuity and Change, Housing Adaptability.

Editorial
Nicholas Wilkinson
Evaluation Of The Occupation And Evacuation Of Peñalolen Settlement, Santiago De Chile - Julián Salas Serrano
Growth Patterns In Incremental Self-Build Housing In Chile - Rodrigo García Alvarado, Dirk Donath, Luis Felipe González Böhme
Flexible Design Of Public Housing In Iqaluit, Nunavut, Canada - Elizabeth Debicka & Avi Friedman
Continuity, Utility And Change: The Urban Compound House In Ghana - S. O. Afram & David Korboe
Analysing Housing Quality: Belerko Housing Settlement, Trabzon, Turkey - Pelin Dursun & Gulsun Saglam
Traditional european squares in contemporary urbanism: Dubrovnik’s medieval squares - Tigran Haas
Tradition And Modernism In Yoruba Architecture: Bridging The Chasm - Olsoba A. Sonaiya & Ozgur Dincurek
Learning From Housing: A Retrospective Narrative Of Housing Environments In North Cyprus - Resmiye Alpar Atun & Hifsiye Pulhan

Vol. 34 No. 4 - September 2010

Guest Edited by Nicholas Wilkinson, Eastern Mediterranean University, Faculty of Architecture, Gazimagusa, Mersin 10, Turkey

vol. 34 no. 3

OPEN HOUSE INTERNATIONAL
Theme Issue: HOME, MIGRATION AND THE CITY: Spatial Forms & Everyday Practices in a Globalizing World

Editorial
Ayona Datta

Evaluation Of The Occupation And Evacuation Of Peñalolen Settlement, Santiago De Chile - Julián Salas Serrano
Growth Patterns In Incremental Self-Build Housing In Chile - Rodrigo García Alvarado, Dirk Donath, Luis Felipe González Böhme
Flexible Design Of Public Housing In Iqaluit, Nunavut, Canada - Elizabeth Debicka & Avi Friedman
Continuity, Utility And Change: The Urban Compound House In Ghana - S. O. Afram & David Korboe
Analysing Housing Quality: Belerko Housing Settlement, Trabzon, Turkey - Pelin Dursun & Gulsun Saglam
Traditional european squares in contemporary urbanism: Dubrovnik’s medieval squares - Tigran Haas
Tradition And Modernism In Yoruba Architecture: Bridging The Chasm - Olsoba A. Sonaiya & Ozgur Dincurek
Learning From Housing: A Retrospective Narrative Of Housing Environments In North Cyprus - Resmiye Alpar Atun & Hifsiye Pulhan

Vol. 34 No. 3 - September 2010

Guest Edited by Ayona Datta Cities Programme, London School of Economics, UK.
Next Issue
Vol.35 No.4 2010

Culture, Space and Revitalisation: Strategies and Experiences of Urban Renewal and Transformation

Guest Editors: Prof. Dr. Hülya Turgut, Istanbul Technical University, Turkey, Prof. Dr. Rod Lawrence, University of Geneva, Switzerland and Dr. Peter Kellett, University of Newcastle upon Tyne, UK.
E-mails: space@itu.edu.tr; Roderick.Lawrence@unige.ch; p.w.kellett@newcastle.ac.uk

Abstract
During the last three decades significant investments of monetary resources and professional expertise have led to numerous projects and programmes concerning urban regeneration, housing renovation, and the revitalization of old neighborhoods. In many countries the common approach used has been based largely on quantifiable criteria related to the functional and physical performance of buildings, the financial return of monetary investments, and projections about demographic and economic trends; it has been rare to explicitly integrate the aspirations, preferences and values of local residents living in or adjacent to many projects. The key question today is how can future projects define a comprehensive programme of work if they continue to ignore the point of view of the local population? Instead of relying heavily on technical solutions by professionals, both quantitative and qualitative approaches are necessary which would involve a wide range of actors from the public and private sectors including citizens.

To explore these issues an international symposium was jointly organized in Istanbul in 2009 by two networks within the International Association of People-Environment Studies (IAPS). These are the Culture and Space in the Built Environment (CSBE) and the Housing network which together have accumulated considerable scientific knowledge which can be integrated with professional know-how to deal effectively with the challenge of ‘requalifying’ the existing built environment. The objective of this issue of Open House International is to examine the relationships between new urban dynamics and urban renewal and transformation projects within the global restructuring process. We have selected key articles among the papers presented at the symposium which explore future solutions and provide a framework for new applications for revitalizing urban environments.

Contents

- Hülya Turgut and Peter Kellett
  Culture, Space and Revitalisation

- Alper Unlu
  Urban Regeneration, Renewal or Rehabilitation What for and for Whom?

- Yael Sivan-Geist and Rachel Kallus
  Planning Versus Plan: A Comparative Analysis of Two Revitalization Processes of City Centers in Tel Aviv and in Haifa

- Priscilla Ananian, Bernard Declève
  Requalificaton of Old Places in Brussels: Increasing density and improving urbanity

- Tamás Egedy
  Current Trends, Strategies and Socio-Economic Implications of Urban Regeneration in Hungary

- David Webb
  Coping with the Politics of Renewal: Insights from a Case Study of Whitefield

- Helena Teräväinen
  Old Paukku in Lapua - Re-Built and Re-Spoken Discursive Formation of Cultural Heritage in a Case Study

- Darko Radovic
  Dialectising Iconoclasm and Resistance - The Roles of Gentrification in Creation of Diverse Urbanities of Tokyo
Editorial

Nabeel Hamdi’s new book The Placemakers’ Guide to Building Community (ISBN 978-1-84407-803-5) published by Earthscan is a very useful book which should be on the shelves of every person involved in building communities and the art of development practices. The outside back cover has a number of short statements which reveal that Nabeel has made a place for himself at the pinnacle of participatory planning and “….has masterfully woven together notions of place making that have evolved since John Turner’s book, Housing by People, into a new paradigm for professional practice” says Bish Sanyal, Ford International Professor of Urban Development and Planning at Massachusetts Institute of Technology.

He starts with a Prologue with reference to how our combined work at the Architectural Association, London and later at the Greater London Council actually started and developed. For a synopsis of that period read pages xiii to xv. If it can be regarded as a success story which I think it was, it was to a large extent due to a series of coincidences brought about by our own enthusiasm for what we were doing. As Nabeel stated in his prologue it was by chance that Kenneth Campbell of the Greater London Council (GLC) telephoned the AA, the call got diverted to us in Chings yard whereby Nabeel picked up the phone and invited him to our presentation and dinner to the Minister of Housing that evening. It was Campbell who later took our ideas and proposals into the GLC for implementation. Things developed from there into TV Omnibus, Life is Right the Architect is Wrong, professional journals, national newspapers, glossy Sunday supplements and the good old London daily the Evening Standard, headlined on their third page “Don’t be Driven up the Wall just move it.”

Later into the seventies Nabeel went to the United States and I to the Netherlands both of us to research and teach. But the period of time we worked together (roughly 1967-1972) created a partnership which could shift mountains and blaze trails, for the sake of better metaphors. Now some thirty years later (and by no means not entirely due to us) local authority social housing and housing associations produce a new landscape of housing which is usually 3-4 stories and of a human scale with opportunities and possibilities for users to be considered as partners in the housing process.

Some Danish examples out of TBA International (Time Based Architecture) in 2008 in the first volume, The Danish Dwelling, March 1988 show the degree to which city infill housing meets peoples requirements at a human scale with courtyard blocks and balconies creating a green and peaceful milieu. Unit sizes come in a wide range in one block.

Other important features which can be found in more than one of the projects shown in this TBA Vol.1 are the collection of items for infill units ranging from detachable bathroom units, kitchens, partitioning and facade systems. These detachable items are all part of the technological development which has been going for more than a decade. This silent revolution has brought us a more useable and adaptable architecture which lead to structures which can grow old yet internally can be easily updated.

Nicholas Wilkinson

(This Vol. 1 of TBA is still available and can be purchased at 10.00 sterling a copy from Carol Punton at openh@hotmail.co.uk) Other copies still available are Vol.2 From Typological to Time Based, Vol.3 Mixed Living and Working Programmes. Vol.4 (out of print). Vol.5 Time Based Architecture in China. Vol.6 Urban Edges Transformed. Vol.7 Time Based Barcelona.

ERRATUM. In Vol.34 No.2 2009 DESIGNING EDIBLE LANDSCAPES the article titled: The Concept of Urban Agriculture Renewed for Cities of the South on page 111, Fig.1 the caption carries an incorrect source reference for the photo image which should read…by kind permission of Awa Ba, 2007 and not by kind permission of Alternatives. The authors and editors apologise to Awa Ba for this mistake.
INTRODUCTION

Smart Homes
The concept smart home has been around for decades and is used to describe buildings with a variety of ICT functions, ranging from housing units for elderly (Bowes, 2003; Doughty, 2003) and for persons with disabilities (Edge et al., 2000; Molin et al., 2007) to single-family houses for ordinary people (Sandström and Keijer, 2007b). A ‘smart home’ allows the resident to control lighting, ventilation, heating, and window blinds, just to mention a few areas. Another closely related area is video-communication in home settings (Junestrand, et al., 2001; Junestrand, et al., 2003). There are surprisingly few evaluations of the residents’ opinions about the IT functions in their homes (Sandström, Werner and Keijer, 2003). This circumstance is particularly pronounced for smart homes installations in ordinary residential building; smart homes support measures in homes of elderly people are more frequent and evaluations are more common (Bierhoff and van Berlo, 2007).

Interviews and surveys
In the city centre of Stockholm, two residential housing units, Vallgossen and Ringblomman, were developed 2000-2002. The buildings were characterised by their smart home systems, based on an entirely novel design. Vallgossen comprised of 126 flats and Ringblomman 59, respectively. In Vallgossen the first occupancy took place in August 2001 and in Ringblomman in February 2002. All 126 flats in Vallgossen were equipped with a basic smart home system, called type 1 flats, while 21 flats had an additional, more advanced system, type 2, see also table 1 below. Two other flats had a further developed system, type 3, which served as test units for trying out the possibilities for assisted living of people with acquired brain injury, see Boman et al. (2007). These two flats, as a test site, were terminated in 2004 as planned, and the functions were redesigned to those of type 2. All flats in Ringblomman had a smart home system similar to type 2, however, in some respects different from that of Vallgossen, see table 1 below, a difference of some significance for the following.

In year 2002 and 2005 interviews were carried out with the residents in Vallgossen and Ringblomman (Sandström et al., 2003; Sandström and Keijer, 2007a). The first interview round focused on the residents’ expectations and short term use while the latter round investigated the residents’ changes of opinion with their long term use.
The results gave evidence to the fact that the residents, in general, were not fully convinced of the potential benefit of the available smart home systems, although opinions were divided. The revealed chief reason for the reluctance was that a particular function had to offer some substantial benefit in comparison to the sacrifice of time, comfort and preferred habits associated with a person's ordinary life. It became clear that this condition was not always met.

Acceptance of technology
Dillon and Morris (1996) made a detailed review of various theories and models of user acceptance. One of the most frequently cited models is the Technology Acceptance Model (TAM) developed by Davis (1989). The TAM model is based on the condition that the user acceptance of any technology is determined chiefly by two factors: 1) perceived usefulness and 2) perceived ease of use. Perceived usefulness is defined as the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organisational context (Davis, 1989). Perceived ease of use refers to the degree to which the prospective user expects the target system to be free of effort (ibid.). Perceived usefulness and perceived ease of use affect jointly the attitude toward the system and thus the behavioural intention to use the system and finally to the actual use of the system.

Trust as a general concept
Attempts to uncover experiences of the concept of trust have been made in a number of disciplines, ranging from philosophy (Baier, 1994; Hosmer, 1995), sociology (Barber, 1983; Gambetta, 1990) and psychology (Deutsch, 1962) to marketing (Kumar, 1996; Moorman, Deshpande and Zaltman, 1993) and management (Driscoll, 1978; Sako, 1998). The subject, however, is still obscured by the fact that each discipline focuses on certain, often particular, elements of the phenomenon (Worchel, 1979).

The presence of multiple definitions of trust in the literature presumably is due to two understandings. First, trust is an abstract concept which is often used interchangeably with related concepts such as credibility, reliability, and confidence (Wang and Emurian, 2005). Thus, to define the term and to delineate the distinction between trust and its related concepts is challenging for researchers. Second, trust is a multi-faceted concept that incorporates cognitive, emotional and behavioural dimensions (Lewis and Weigert, 1985).

The concept of trust was introduced within the TAM framework in an online shopping context, either as a direct antecedent of purchase intention (Gefen, Karahanna and Straub, 2003a) or as a precursor of intended use and perceived usefulness (Gefen, Karahanna and Straub, 2003b). Pavlou (2003) demonstrated a positive impact of trust on perceived usefulness and perceived ease of use.

TRUST IN SMART HOME TECHNOLOGY
Several tasks in a Smart Home operate according to its pre-programmed settings. Parasuraman and Riley (1997) defined automation as the execution by a machine agent (usually a computer) of a function that was previously carried out by a human and claimed that trust often encourages automation usage. Muir (1988) argued that an individual's trust in a machine can be affected by the same factors that influence trust between individuals; e.g. people trust others if the latter are reliable and honest; they lose trust when they are let down or betrayed. Any subsequent redevelopment of trust takes time.

Parasuraman, Molloy and Singh (1993) showed that the use of automation as defined above reflects the reliability of its functioning. Failures bring about reluctance and diminish use, however, infrequent occasional failures do not seem to be completely deterrent against future use. The average user continued to rely on the particular automation, although with increased caution. Trust in digital systems and the relevance of trust in computer mediated communication are e.g. addressed by Shneidman (2000) and Falcone et al. (2002).

According to Chopra and Wallace (2003) trust is an attitude held by an individual, the trustor, in our case the resident. It is influenced by his or her personality and by the attributes of the recipient, i.e. the smart home function. The recipient influences the behaviour of the trustor. Trust is an attitude composed of two constituents: confidence in positive outcomes and willingness to modify one's behaviour in expectation of those outcomes. Thus, an integrated definition of trust recognises it as the union of three elements: 1) the trustee (the function)
to whom (or to which) the trust is directed, 2) the confidence that the trust will be upheld, and 3) the willingness to act based on this confidence.

Trust in information is an attitude directed toward a technological artefact (Chopra and Wallace, 2003), in this case a specific item of information. The trustee is the smart home system, e.g. a specific text or figure presented in the smart home system's graphical user interface (GUI) or a signal of some other kind. The confidence exists because the trustor (the resident) expects the information to be reliable and valid. Moreover, the user enters into the relation willingly, since he or she is free to accept or discard the information or to select an entirely different method in order to perform the particular activity.

THE STUDY OBJECTS

The Smart Home Systems
The basic idea with the abovementioned establishment of a smart home system and to implement it in ordinary residential buildings was based on a pronounced user-centred approach. The smart home system was to be a central factor in the resident's everyday life. The resident would be able to gather all their family information and store it in a safe and accessible place, and to use this information to communicate within the family (e-notes), to communicate with others (e-mail and address book) and to co-ordinate the family activities (calendar). Further, the smart home system would contribute to increased safety at home (alarms) and to control energy use. The GUI used by the residents when operating the smart home system was called the Home Network, not to be confused by an ordinary computer network (LAN). An overview of the functionalities of the smart home systems is given in table 1.

Differences concerning accessibility
An important difference between the two housing units was the accessibility to their smart home systems. In Vallgossen the residents used the smart home system via the laptop computer. In each flat only one single socket was available to connect to the smart home system. The other sockets were designed for the broadband. The laptop computer had two different partitions, forcing the user to restart the computer whenever a switch between the broadband and the smart home system was desired.

In Ringblomman, on the other hand, a touch screen on the wall made up the physical user interface. The smart home system was activated through a tap on a touch screen, allowing the residents to interact with the system by pointing at pictures or words on the screen.

Discouraging failures
Now and then due to some technical shortcoming the front doors of the flats in Ringblomman could not be unlocked when arriving from outside. Further, if a member in a household locked the door with the away-lock while some other person still remained inside, it became impossible to get out; the lock had to be freed from outside. For some reason the same problem did not arise in Vallgossen. In addition, the burglar alarm was technically linked to the away-lock, i.e. the burglar alarm was set on when the away-lock was locked.

At start there were also some problems with the energy monitoring functions in both Vallgossen and Ringblomman. The smart home system was designed with the assumption that all flats were inhabited. This was not the case; the flats were occupied during a significant period of time. Consequently, it became impossible to compare one's own usage of energy with the average energy user in the building a feature attracting a certain interest by the inhabitants to be. In addition, in Ringblomman all water meters proved to be defective.

METHOD

Background to the survey
Several studies based on interviews with the residents have been conducted in Vallgossen and Ringblomman (Sandström et al., 2003; Sandström and Keijer, 2007a). A number of clear observations were revealed from these semi-structured interviews. For example, the residents generally appreciated functions that increased their feeling of safety and security, and also functions that saved time. Other functions were less appreciated. There were some significant differences between Vallgossen and Ringblomman. Residents in Vallgossen were generally more positive regarding the alarm system and the residents in Ringblomman used some sim-
<table>
<thead>
<tr>
<th>System/Equipment</th>
<th>Function</th>
<th>Vallgossen</th>
<th>Ringblomman</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Home network</strong></td>
<td>Includes energy use, lighting and heating control, weather forecast, home-security, a family calendar, e-notes, e-mail, “away lock”, bookings of common facilities, lighting control and heating control.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Energy use</strong></td>
<td>Presents the measured use of electricity, gas and water on a daily basis as well as over a requested period for each energy type. The resident can also compare this usage with the average use in the building.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Alarms</strong></td>
<td>Includes fire, leakage and burglar alarms. If anything is wrong the alarm in set to send a message to the resident by SMS or e-mail. In Vallgossen the message can also be sent to an operator of security.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Lighting</strong></td>
<td>The residents can choose which sockets should be on/off at different point of time.</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td><strong>Heating</strong></td>
<td>The residents can create their own temperature profile for every room in the flat.</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td><strong>Weather forecast</strong></td>
<td>Shows the weather of today and the following day.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Clock</strong></td>
<td>A digital clock in the home network.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Calendar</strong></td>
<td>A calendar that co-ordinates the family’s activities.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>E-notes</strong></td>
<td>The residents can leave e-notes to the rest of the family and create common reminder lists. Then, SMS or e-mail can send the list to a recipient.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Voice notes</strong></td>
<td>It is possible to record voice-messages.</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>E-mail</strong></td>
<td>Ordinary e-mail.</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>“Away lock”</strong></td>
<td>Controls the main water supply, electricity and/or gas to the stove, lamp in the hall, the burglar motion detector, power sockets, ventilation, lighting and heating.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Bookings of common facilities</strong></td>
<td>To operate the laundry room or the sauna, the use of a party room or a guestroom. A signal to the residents’ mobile phone or laptop computer reminds the residents that they have a service booked. The residents can also supervise the washing machines in the laundry room and receive a signal via the laptop computer when the washing machines are done.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Laptop computer</strong></td>
<td>To control the home network.</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>Touch Screen</strong></td>
<td>To control the home network.</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>Broadband connection</strong></td>
<td>To surf on the Internet.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Integrated system for data and telephone</strong></td>
<td>Same socket in a room can be used for both units.</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td><strong>Electronic key</strong></td>
<td>To open the door to the lobby and general spaces, e.g. the garage and the laundry room. In Ringblomman the residents also use the electronic key to open the door to the flat.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Security camera at the front door</strong></td>
<td>The residents can both see and talk to the visitors via the camera before letting them into the building. **</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Reception boxes</strong></td>
<td>A space for reception of ordered goods.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Built-in grid system for loud speakers</strong></td>
<td>Connects the stereo in the living room with loud speakers in the kitchen and in the bathroom.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* When the entrance door is locked, the water is automatically shut off two hours after locking, as well as gas or electricity to stove, sockets above the worktop, lighting and heating. Further, the ventilation in the bathroom is reduced (if the moisture detector does not indicate a need for ventilation) and the burglar alarm is set on. When the resident comes home, the lamp in the hall lights up and the main water supply, the gas, sockets, ventilation, lighting and heating are switched on automatically. The light in the hall is on until the resident manually turns it off. It is only in Vallgossen where the “away lock” controls ventilation and gas and it is only in Ringblomman that the “away lock” controls the lighting and heating.

** The security camera at the front door is separated from the home network in Vallgossen, but not in Ringblomman. The residents in Vallgossen can look at the person who stands at the front door without bringing it to that person’s knowledge. This gives the residents an opportunity to choose if they want to “be at home or not”. This opportunity is not available for the residents in Ringblomman.

Table 1. Description of the smart home system in Vallgossen and Ringblomman.
pler functions in the smart home system more frequently than those in Vallgossen.

To complement the interview series an assessment questionnaire was worked out for a larger group of users of the studied smart home systems. The idea was to investigate some patterns of use in detail and be able to discern further general conclusions. The matter of trust was also to be addressed in this new investigation.

The type of questions were of three kinds, viz. 1) information of the household’s and the resident’s social and economic background, 2) what functions of the smart home system they used and with what frequency, 3) questions about accessibility and ease of use of the functions of the current system.

**Selection of informants**

When the survey was carried out, some respondents had stayed four years in Vallgossen at the most and three and a half years in Ringblomman. A majority of the respondents in Vallgossen (72 percent) and in Ringblomman (70 percent) had lived at least two years in their homes.

Nearly two out of five residents (38 percent) lived in single households in Vallgossen, compared to 18 percent in Ringblomman. Couples without children were 35 percent of the total inhabitants in Vallgossen and 43 percent in Ringblomman. The portions of couples with children under 18 years of age were 27 percent in Vallgossen and 35 percent in Ringblomman, respectively. Five (5) percent were single parents in Ringblomman and none in Vallgossen. The age structure is given in table 2.

**Dropouts**

The percentage of answers was acceptable for this type of investigation, where 50-70 % (Cohen, Manion and Morrison, 2000) is supposed to be typical, see table 3. The dropouts in the study was classified into three categories:

1. Respondents, who choose not to answer the questionnaire.
2. Respondents, who choose to answer some questions with ‘No opinion’. These respondents have been excluded from the analysis of these particular questions.
3. Respondents who choose not to answer a specific question. These respondents were also excluded from the analysis for this question.

It is obvious that only dropouts of category 2 and 3 can be analysed with the survey, as individual characteristics are available for these categories. There were few dropouts of category 2 and 3; as a consequence further analysis of the dropouts was not meaningful.

**Analyses**

The answers of questions of the survey are structured according to ordinal scales, see the following section. The results were analysed with the Mann-Whitney test, a nonparametric test (Siegel and Castellan, 1988). The test is a rank sum test and compares two unpaired groups by ranking all the values from low to high, and comparing the mean rank in the two groups. If the "sig" (for significance) value is less than 0.05 (5 %), the "null hypothesis" is supposed to be rejected, which means that there is a significant difference between the two groups.

**RESULTS**

**Function used**

The respondents were asked to judge their use on a five-level Likert scale as follows:

#1 - never
#2 - rarely
#3 - a couple of times per month
#4 - a couple of times per week
#5 - everyday

Regarding the use of the broadband connection, the booking system and the energy measurement, the residents’ judgements revealed no significant difference between the two sites, see table 4. The
broadband connection was considered to be the most frequently used function; 75 percent in Ringblomman and 70 percent in Vallgossen used the broadband connection every day, see table 4. In the following, medians are given in the tables. Percentage portions are reported in the text, only.

All other functions in table 4 unveiled significant differences in use between the two housing units. In Vallgossen more than half of the respondents (56 percent) claimed that they used the away lock everyday; compared to 25 percent in Ringblomman. Two out of five (40 percent) in Ringblomman reported that they never used the away lock, compared to Vallgossen's 18 percent.

The weather forecast was the second most used function in Ringblomman. Almost half of the respondents (48 percent) used it every day, and the portion who used it twice a week or more was 68 percent. In Vallgossen a meagre five (5) percent used it every day and only 17 percent used it twice a week or more.

Other functions showing similar differences in usage were the indoor thermometer and the clock. In Ringblomman 43 percent used the clock and 20 percent used the indoor thermometer every day, compared to six (6) percent and five (5) percent, respectively, in Vallgossen.

Results regarding ease of use and accessibility

The residents were asked to express statements about their opinions regarding accessibility and ease of use of the smart home functions. A four-level ordinal scale was applied and the answer "no opinion" was allowed, too.

#1 - I do not agree at all or to a very little extent
#2 - I agree to some extent
#3 - I agree rather much
#4 - I agree very much
#5 - No opinion

Opinions regarding statement 1 and statement 2, presented in table 5, showed significant differences between the groups, although the medians were the same. The largest category of respondents in Vallgossen (44 percent) stated that the smart home system was "rather easy" to learn and 34 percent said it was "very easy". In Ringblomman 50 percent said it was "rather easy" and only 10 percent mentioned "very easy".

One in three (30 percent) in Vallgossen claimed that it was "very easy" to remember how to use the smart home system, while only seven (7) percent in Ringblomman agreed to that. Most of the respondents (58 percent) in Ringblomman mentioned it was "rather easy" to remember. The corresponding number in Vallgossen was 46 percent.

The importance of fast access to the smart home system seemed to be rated higher in Ringblomman than in Vallgossen. More than half of the respondents (53 percent) in Ringblomman mentioned it was "very important to have access without delay (fast access), compared to only 28 percent in Vallgossen. 80 percent in Ringblomman mentioned it was very important to have fast access to the broadband, compared to 63 percent in Vallgossen. However no significant differences between the groups could be claimed regarding fast access based on the available data.

![Table 4. Median of reported use of certain functions in Vallgossen and Ringblomman, respectively. A significant difference between the group if sig<0,05 (Mann-Whitney test).](image)

![Table 5. Median values of statements regarding easy to use and accessibility. A significant difference between the group if sig<0,05 (Mann-Whitney test).](image)
Regarding external support in case of trouble, the results showed that it seemed to be more important to have fast support for the broadband than for the smart home system. 83 percent of the respondents in Ringblomman stated that it was very important with fast support for the broadband and only 48 percent mentioned it regarding the smart home system. In Vallgossen the corresponding numbers were 65 percent (broadband) and 37 percent (smart home system). No significant difference between the groups could be shown.

**DISCUSSION**

Most respondents included in the survey had used the smart home systems in their homes at least during a two-year period, many of them three to four years. When the respondents moved in they started to familiarise with the systems (Sandström et al., 2003). Over time they chose to use the functions they found most useful. Although the similarities in technology and in available functions for the two sites are striking, some minor distinctions between them create clear differences in outcome regarding attitudes to certain offered functions or the residents’ acceptance of the services.

The observed differences will be given a tentative interpretation by returning to the two previously unfolded concepts of trust and accessibility.

**Trust**

The integrated definition of trust, Chopra and Wallace (2003), see above, relate three elements: the trustee (the function) to whom the trust is directed, the confidence (of the resident) that the trust will be upheld, and a willingness to act (by the resident) based on this confidence. Two examples from the described study, the away lock and the energy measurement show how trust, in the present meaning, affects the use of a function.

The away-lock was used more frequently in Vallgossen than in Ringblomman. The uncertain away-lock function in Ringblomman worried the respondents and trust could not be gained with time for this particular device. No similar problems arose in Vallgossen and trust seemed to be maintained, table 4.

Due to the initial problems with the energy monitoring functions described in the introduction section the respondents revealed, during interviews in 2002, that most of them adopted a wait-and-see policy until the system was in order and became stable (Sandström et al., 2003). In 2005 many respondents still revealed that the energy metering system was of no use, despite it functioned since long. They did not rely on the energy measurement from the beginning; to use it later on was highly influenced by their previous mistrust (Sandström and Keijer, 2007a).

**Accessibility**

The accessibility to the smart home system in Vallgossen involved an inconvenient and irrelevant physical move in the flat and a restart of the laptop (figure 1) to establish a connection to the system. As none of the functions in the smart home system...
really required a daily visit by the residents, to refrain from using it at all was not a big sacrifice and, as a consequence, the associated functions were less used.

In Ringblomman, on the other hand, the touch screen (figure 2) was incessantly connected to the smart home system; thus it was never required to switch from one task to another or to restart the screen to establish access the smart home system.

This difference in screen solution affected the use of the functions at the two sites. The weather forecast, the indoor temperature and the clock showed a noticeable difference in use. Almost half of the respondents in Ringblomman used the weather forecast everyday, compared to only 5 percent in Vallgossen, as reported above. In Ringblomman, the residents only had to touch the screen in order to use it. In Vallgossen, the residents must restart their laptop computer. A move to the sole socket in the flat with a connection became often necessary. A swifter accessibility to the smart home system increased the use of its functions in Ringblomman, which corresponds to the obtained statistics.

The use of e-mail, calendar and e-notes were low in both groups. The low frequency of use in Vallgossen can probably be explained by the screen solution (the laptop computer). Earlier interview studies in Ringblomman revealed the reason to the low frequency of use at this site (Sandström et al., 2003). The respondents mentioned it took too long time to write on the touch screen. It would have been better with a separate keyboard. Thus, also physical accessibility counts.

CONCLUSIONS

The smart home system installed in Vallgossen and Ringblomman, totally 185 flats, was not installed elsewhere before. Tests of the system were performed only in a laboratory environment prior to the site installations. As a consequence, not all possible faults and errors were detected in advance. The residents had to find them. Coping with a new and unstable technology is not the best environment for imposing trust between a user and a technological system. A system should function from an early point of time in order to gain trust over time and be included in the daily routine as a regular service at home.

Small differences in design of a smart home system, affecting accessibility and trust have been shown to make large differences in usage. From a pure technical point of view most solutions function. But from the user's point of view also minor differences decide if a system will be used or not.

ACKNOWLEDGEMENT

The authors gratefully acknowledges the financial support by JM AB and the Development Fund of the Swedish Construction Industry (SBUF). The academic supervision of the research project was partly funded by the Swedish Formas Research Council.

REFERENCES


Authors’ Addresses:
Greger Sandström & Ulf Keijer
Royal Institute of Technology,
The Architectural School
SE-100 44 Stockholm, Sweden
greger.sandstrom@jm.se
ulf.keijer@arch.kth.se
INTRODUCTION

The 2006 Java earthquake resulted in a huge loss of life and destroyed thousands of buildings. Although the actual shaking only lasted 59 seconds with a magnitude of 5.9 on the Richter scale, over 6,060 people were killed and a further 63,305 injured (WHO, 2006). More than 300,000 houses were destroyed or damaged beyond repair, with minor damage to a further 200,000 houses. This left 1.6 million people homeless (UN-OCHA, 2006). Eight districts in the Yogyakarta and Central Java Provinces suffered extensive damage. The majority of the destroyed houses were mostly located in the area near the epicenter of the earthquake in the southern rural provinces of Yogyakarta and central Java. The housing in these regions is principally comprised of the Javanese vernacular housing type.

Soon after the implementation of the emergency post disaster period, the Indonesian government, supported by various relief organizations, redeveloped the destroyed area with a reconstruction programme. This programme was highly successful and 279,000 houses were rebuilt and 253,000 were repaired and restored in a very short time - within a two year period (JRF, 2008). Within the reconstruction programme, a large variety of new housing types were offered starting from the very simple to the strange and unusual. The purpose was to provide people with more quakeproof houses. “Engineered houses”, houses with brick wall and reinforced concrete frame were the most suitable ones even although there were no fixed specifications for reconstructing the collapsed houses. Any donor could introduce any structural type of building. The people themselves were also given a chance to participate in the rebuilding of their hous-
es. Many approaches, either governmental or non-governmental (see Tas, N, et.al, 2007) for providing housing were used. As a result, as aforesaid, the many types of new housing in the area ranges from simple to advanced construction systems.

Bolton (1996) explained that people were usually willing to take up residence in the new housing as long as it matched some of their expectations. Users also generally refuse a physical environment that is inconsistent with their own socio-cultural and socio-economic structures (Tas, et.al, 2007). However, since a form of shelter is the primary basic need of all human beings, those who have lost their homes, are prepared to forego other basic requirements which a house should offer or provide as long as the physical need for shelter is met at this time. This issue is dealt with in Maslow’s hierarchy of needs (Maslow, 1943).

However, as a physical entity, a house or dwelling place is not only the result of various physical forces coming together in the construction process, or of any single causal factor, but also the consequence or outcome of a whole range of combined and separate socio-cultural factors as seen in their broadest terms. A house and its form, is, in turn, modified by climatic conditions and by the methods of construction used, materials available, and the technology, socio-cultural forces and the other secondary or modifying factors (Rapoport, 1969). Offering or ensuring only the safety of structure of a building cannot resolve the physiological, psychological, and social cultural requirements of the individuals and community as users and or residents. Efforts and attempts to re build or develop new physical environments, which, in themselves, may fail to meet the needs and expectations of the community, as a result of a lack of knowledge or awareness on behalf of the planners or construction company of the importance of considering and integrating the needs of the society or community affected with the building of new homes and community buildings. It is clear, therefore, that the expenditure of large sums of money in any given disaster area may not always result in the most satisfactory outcome for those people affected despite the fact that they have a roof over their heads.

In respect of the Javanese situation, there is a triggering issue that the recently reconstructed houses are highly believed to be the most proper answer to provide the better houses to the people. Compacted core housing with a reinforced concrete system was the preference, whilst on the other hand; there are still many alternative housing options in Java. Although, in fact, about two thirds of the buildings in Indonesia are non-engineered (Kusumastuti D, et.al, 2008), is of the opinion that this does not necessarily mean that all of those are of inferior quality, especially if we are dealing with traditional or vernacular housing. Safety and security are not, therefore, the only important issues involved in housing construction and thus it cannot be only be viewed and judged from this narrow perspective. It is, therefore, necessary to also assess and examine the housing quality according to the needs of the people who will live in it (local compatibility).

PROBLEM STATEMENTS AND EXAMINATION METHODS

Post disaster housing after the 2006 earthquake had resulted in the construction of an increased variety of houses in Java and triggered the changes in quality between them. The massive destruction of houses had been seen solely as the failure of the vernacular Javanese houses and the replacing of these houses with the compacted houses is broadly assumed as the only way of resolving the housing problems. To make sure that the new houses have a significant value to alternate the older house, thorough and comprehensive quality assessments are required to be carried on all housing stock in order to confirm the problem of this study.

To determine the study, the house typology will be examined initially in order to define every house type and to rediscover the terminology of traditional, vernacular, modern, or foreign housing in Java. From all these types, one or more will be identified, which is more prone than others to collapse during an earthquake, thus establishing and confirming which housing construction type(s) failed in the 2006 Java earthquake. Quality assessments then will be applied to all types of housing by using a scoring system developed from acceptable criteria in which every aspect is examined. In order to test how to fulfill the basic need for housing, Maslow’s classical theory of hierarchical needs is used to discover house compliance by user needs using an interpretation related to the housing aspects in respect of the specific grading method.
LESSON LEARNT FROM THE 2006 JAVA EARTHQUAKE

In the 2006 Java earthquake, just less than 3% of traditional housing failed or collapsed throughout all the areas affected by the earthquake (Bappenas 2006a). In the area of Kota Gede where there are many traditional houses, from a total of 150 of the joglo type, 21 of them collapsed, 25 were severely damaged, and 75 slightly damaged (Sinar Harapan 2007). In other cases, in the e.g. Banguntapan village of Bantul, 30% of traditional houses collapsed and were damaged from a total of 216 houses and, miraculously, only 6 people died out of a total of 3600 inhabitants (Koran Jakarta, 2009). This reduction in damage and in casualty figures compared to the country's overall figure is believed to be as a result of the use of non-heavy materials in the construction of traditional housing.

The most significant figure involving the traditional wooden structures and masonry houses correlated to the number of victims can be discovered by examining the statistical data of the most damaged areas in ten sub-districts of Bantul Yogyakarta (see table 1). According to the data, the highest percentage of victims related to the failure of the buildings took place in town areas such as Bantul and Kretek, where masonry houses were highly populated. Whilst in village areas such as Pleret, Jetis and, Pundong, even though the percentage of destroyed houses was higher, the casualties were relatively less. Since the earthquake was very powerful and the destroyed houses were a mixture of all housing types, this figure is not intended to show the comparative figures of damaged buildings, but rather the level of occupant safety in the damaged buildings. The differing figure between the percentages of victims related to the damaged building demonstrates the safety level in different housing types. The only reasonable explanation for this fact is that the lighter structure of the vernacular wooden house type must be safer for people.

JAVANESE HOUSING DEVELOPMENTS

Throughout time, Javanese architecture has always been at a crossroads between traditional local housing and modern housing. Javanese housing history can be traced back to the 9th century AD and is depicted in Borobudur temple reliefs. A wooden structure was used in the original houses whilst stones and bricks were mostly used in temples (Mees n.d). The lack of the durability of wood as a construction material, and the tropical climate meant that the houses only lasted for a few hundred years. The oldest, original houses recorded of this kind are now known as Javanese traditional houses.

Building forms in Javanese houses are mainly based on five types of roof configuration, from the simplest to the most complex; Panggangan, Panggangpe,}

<table>
<thead>
<tr>
<th>No</th>
<th>Sub-districts</th>
<th>Total Houses*</th>
<th>Total uninhabitable buildings **</th>
<th>% Building uninhabitable</th>
<th>Population</th>
<th>Total Victims***</th>
<th>% victim to population</th>
<th>%victim to uninhabitable buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BAMBANG LIPURO</td>
<td>12438</td>
<td>9319</td>
<td>75</td>
<td>43.966</td>
<td>548</td>
<td>1.2</td>
<td>5.9</td>
</tr>
<tr>
<td>2</td>
<td>BANTUL</td>
<td>17425</td>
<td>12086</td>
<td>69</td>
<td>60.799</td>
<td>1312</td>
<td>2.2</td>
<td>10.9</td>
</tr>
<tr>
<td>3</td>
<td>IMOGIRI</td>
<td>16129</td>
<td>11017</td>
<td>68</td>
<td>58.482</td>
<td>401</td>
<td>0.7</td>
<td>3.6</td>
</tr>
<tr>
<td>4</td>
<td>PLERET</td>
<td>12393</td>
<td>10461</td>
<td>84</td>
<td>34.600</td>
<td>565</td>
<td>1.7</td>
<td>5.7</td>
</tr>
<tr>
<td>5</td>
<td>JETIS</td>
<td>14544</td>
<td>13727</td>
<td>94</td>
<td>51.083</td>
<td>366</td>
<td>0.7</td>
<td>2.7</td>
</tr>
<tr>
<td>6</td>
<td>KRETEK</td>
<td>9607</td>
<td>5746</td>
<td>60</td>
<td>31.704</td>
<td>869</td>
<td>2.7</td>
<td>15.1</td>
</tr>
<tr>
<td>7</td>
<td>PANDAK</td>
<td>13454</td>
<td>8071</td>
<td>60</td>
<td>49.996</td>
<td>247</td>
<td>0.5</td>
<td>3.1</td>
</tr>
<tr>
<td>8</td>
<td>PIYUNGAN</td>
<td>13931</td>
<td>10315</td>
<td>74</td>
<td>38.911</td>
<td>153</td>
<td>0.4</td>
<td>1.5</td>
</tr>
<tr>
<td>9</td>
<td>PUNDONG</td>
<td>10252</td>
<td>8696</td>
<td>85</td>
<td>32.561</td>
<td>120</td>
<td>0.4</td>
<td>1.4</td>
</tr>
<tr>
<td>10</td>
<td>SEWON</td>
<td>29470</td>
<td>16777</td>
<td>57</td>
<td>79.382</td>
<td>304</td>
<td>0.4</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Note:
* Census data of 2003 PODES by 12% of growth assumption  ** uninhabited houses in respect of collapsed and severely damaged houses  *** Victims considered as dead and badly injured

Table 1. Statistical data of the ten most affected areas in Bantul related to the buildings failure and victims (raw data taken from Bappenas 2006b and Depkes 2007)
Kampung, Limasan, Joglo and Tajug (Ismunandar, 1993; Prijotomo, 1984; Dakung, 1981). From these five major types, at least 18 variants can be generated as result of their construction design and dimension differences. However, three types (Kampung, Limasan and Joglo) are the most common (Idham, N, 2006). The first one of the five roof configurations (Panggang-Pe) is mostly used for temporary construction, and the last one, known as Tajug is only used for important or religious buildings such as mosques, temples and graves.

a. Pure Tradition (PT)
This style belongs purely to the Javanese, and is previously known as Joglo, Limasan, and Kampung. All main structural system members are constructed with all kinds of wood, including hardwood, coconut palm tree wood, or bamboo. The use of wooden planks or woven bamboo was a common material used for walls, wooden tiles or thatch also was used for roof construction, but it is not any longer.

Houses are relatively large and are composed of more than one unit depending on the wealth of the owner. However, nowadays these types of houses are rarely built nowadays although they do still exist and may belong either to a rich owner, who still wishes to maintain his/her status/position in the towns and cities, therefore constructs the classic Joglo, or to villagers who live in remote area and require simpler wooden housing (see fig 3). In relation to the earthquake, these houses proved to be safer as a result of the use of lightweight materials, thus providing a more flexible structural system.

b. Old Culture (OC)
The old culture and new culture are terminologies first used by Boen (2006) to distinguish between the Dutch colonial era and the post independence-modern technique used in housing construction in Indonesia. The term ‘Old culture’ refers to the colonial era when houses were built using predominantly a thick weight-bearing wall system and burned clay roof tiles for roofing. In respect of the vernacular housing, this technique was adopted for constructing Javanese housing by replacing the wooden wall and roof with a brick masonry wall and clay roof tiles. However, overall, the style and forms used were still in keeping with the three traditional house types mentioned above, excluding the houses built by the Dutch themselves. These types of houses were very common for the Javanese since the local population were increasingly of the opinion and judgment that brick-walled houses are related directly to the wealth of the owner. In recent times, we can still easily find these houses throughout Java. Unfortunately, the use of low quality heavy bricks for the construction of the bearing wall was one of the main reasons for the collapse of houses
during the earthquake. It is also believed to a main causal factor for the high number of fatalities.

**New Culture (NC)**

New culture type is applicable to the new contemporary houses. Brick wall combined with a reinforced concrete frame structure is the main structural system of the houses. Ceramic roof and floor tiles are common materials used for roof and floor coverings. The size of the houses is mostly smaller than the two types described above (pure tradition and old culture types). Since the trend of having a large house is decreasing, the younger generation preferring to live on their own as a single family as opposed to the extended family all living under one roof. The form of the new culture type construction is also simpler. This type of housing started to develop sharply between the 80’s -90’s when Portland cement and steel bars started to be widely used. However, in fact, a mixed application of the old and new cultures for housing construction is also, to date, widely used. During or after the earthquake, many houses were also collapsed or badly damaged as a result of weak connections and poor or quality of both the structural materials used and the construction methods used. The use of heavy material, similar to that of the older houses, resulted in high numbers of casualities and fatalities.

**Reconstruction House (RH)**

Reconstruction housing was built after the 2006 Java earthquake. They are constructed mostly using...
brick walls and a more complete reinforced concrete framing system. Since the majority of collapsed houses should be rebuilt within a limited time period and budget, following an earthquake or other disaster, it was common practice to build a very simple, small house using a simple construction form, known as a core house. These core houses vary in size (e.g. 18-20 square meters). They are built in the disaster area, although larger houses were also built since the government also permits people to rebuild by themselves. Sometimes people have continued to extend the core houses according to their needs and finances. In one case study of this issue Ikaputra (2008) found that almost all core houses had been extended by up to 97.22%.

Foreign Culture (FC)
One of the most strange reconstruction post quake houses is a shell- shape or domed house (see fig 6 above) built by a DFTW (Dome for the World) donor. This housing actually does not represent the common trend in the area. It has been used as a kind of prototype in order to examine or assess the potential positive and negative influences of its structure on the local housing. In the Yogyakarta area seventy-one new units of this type were built to replace the completely sunken village of Nglepen. This type of house is 7 meters in diameter with a total area of about 38 square meters and constructed using a shell-shaped concrete structure (Saraswati,T, 2007). There is no internal bathroom or WC facility. A communal toilet is provided by the developer for every 12 units.

From the many house types described above, what are considered as vernacular houses are the houses built without a designer or architect and which are built in the purely tradition style, old culture, and new culture. All these three types have distinctive characteristics and they that cannot be described as single type by simply categorizing them as Javanese vernacular architecture. For this reason, every vernacular house in Java has very significant differences and should be examined independently. It is possible that all housing types can be destroyed in an earthquake but a less heavy structure offers a greater opportunity of survival for both the building and its inhabitants.

HOUSING QUALITY EXAMINATION
The housing quality, how the houses fulfill housing needs of the people and how they match with the local conditions, will be assessed by Maslow’s hierarchy and quality aspect based on local preferences. The first assessment is aimed for rediscovering the level of achievement for every step of needs in housing while the second assessment is intended for measuring the level of acceptance in every type of the house.

Maslow’s Hierarchy Assessment
The first assessment in this study to review and
examine the houses using Abraham Maslow's classical theory of the five hierarchical needs; physiological need, safety need, social need, self-esteem, and self-actualization needs (Maslow, 1943). This hierarchy appears to be a fixed order, but actually this is not the case (Green, CD, 2000). In applying this theory to Javanese housing, an interpretation related to the housing aspects in respect of the specific grading method is required. Meanings are given at every hierarchical level to define specific aspects associated with the housing (see table 2). The way in which each one of the housing type fulfills the needs and meets the requirements of the people will be confirmed by the presence or availability of those related aspects within the houses themselves.

An interpretation of Maslow's hierarchy of needs in housing can be seen in table:

![Table 2. An interpretation of Maslow's hierarchy of needs as applied to housing needs and requirements](image)

From the table, it can be assumed that:
- All housing types meet the physiological need for shelter, but they do not necessarily meet all the other remaining needs per se.
- Purely traditional houses are lacking in utilities since there is mostly no proper sanitary system. This lack of utilities also applies to older houses.
- Old Culture housing lacks both utilities and structural safety since the construction system used to build it uses an inadequate and inappropriate brick/masonry wall bearing system, which demonstrated its inadequacy during the 2006 earthquake.
- New Culture housing - with regard to this housing type, the structural safety need is still in question in respect of the quality of the construction system and the building material used. It also does not meet the social need requirement since the common meeting/gathering space is limited in this type of housing.
- Reconstructed houses do not meet the social need requirement since there is not enough communal space, and, therefore, the possibili-

![Table 3. Scoring system applied as related to Maslow's hierarchy of needs](image)
ty of meeting the need for self actualization is reduced, since there is very little opportunity to promote the potential personal identity in a large number of donated houses. However, those inhabitants affected have negotiated to redevelop the houses by themselves in due course.

- Culturally foreign housing (domed house) is only aimed to provide for physiological and safety needs, whilst abandoning or foregoing the other needs, including the issue of not meeting the need for self-esteem since the form of the house construction is, culturally, so strange, it would not be easily recognized as having a local identity or belonging to the local indigenous culture.

The results above prove and demonstrate that the issue of meeting the basic human needs requirements in Javanese housing, does not always necessarily follow Maslow's fixed hierarchy per se, since it also depends on certain other conditions e.g. it does depend on the quality of the environment based on the location, the events taking place and the overall circumstances at the time. Needs cannot always be met or achieved a fixed order. Special preferences and priorities will emerge whenever people are faced with a new standard following and according to, as stated earlier, whatever the circumstances or conditions are, or whatever event has taken place. All the Javanese house types are lacking at some level, in respect of the theory of hierarchical needs. This lack is most probably generated by certain historical and culturally traditional aspects; big and complex for purely traditional architecture, heavy -dense material for old culture architecture, simplicity for modern culture, safety and security for reconstructed houses.

Quality Assessment

One of the quality assessment methods used is to review housing by using a measurement tool designed to allow potential or existing housing to be evaluated on the basis of quality. It can be examined by Housing Quality Indicators (HQI, used in UK) based on three categories of, location, design, and the external environment / performance (Housing Corporation, 2007, Harrison, 1999). Another assessment method is used by the US Department of Housing and Urban Development with Housing Quality Standard (HQS). HQS, which is defined as standard for housing and establishes the minimum criteria necessary for health and safety, uses 13 performance requirements (HUD, 2009). While HQI uses a spatial approach from macro to micro aspects, HQS uses functional reviews starting from environmental control to detailed finishing materials.

The quality assessment should cover all aspects of housing. However, this categorization must be in directly related to the main purpose of the examination itself and applicable to the object. In other words, categorization and its aspects can be modified according to the circumstances and the condition of the specific case or situation. Since this study aims to review the house typology rather than the housing scheme, the quality assessment proposed to review the Javanese vernacular housing is examined by the most locally-applicable aspects; climatic adjustment, space-function, safety and security, and utility and comfort.

Climatic Adjustment

The first requirement of a house is that it provides shelter from nature. Climatic adjustment is the first aspect to be examined, in order to adapt the construction as e.g. in the case of Java to the warm-humid tropical climate. Direct sunlight is the most obstructive factor. Orientation and layout are the most important related factors to be assessed and taken into account in respect of this issue. Since the annual sun angle is never below 23.5° both north and south equator areas only experience a relatively east to west sun path. To avoid direct sunlight, therefore, housing should be built with a north-south orientation.

In order to deal with warm-humid temperatures, a shaded construction site is also desirable, as is a design layout which offers an integration of closed and open air spaces inside the building. An overhang, as an extension of the roof, is also necessary to provide shade and a cooler space.

Besides the excessive direct sunlight, the efficient drainage of rain water is also one of the main problems in the area. Buildings, therefore, are required to integrate special shapes into their construction, which easily drain the rain water and provide more shade. A high pitched roof with an overhang is the best solution. The high roof also offers an opportunity to create a spacious interior living area. This design also provides good air circulation (Idham, N and Aksugur, E 2006).
**Space-function**

The second aspect is space-function relationship. Since the main purpose of a house is to provide shelter and accommodation, the rooms should serve the necessary functions. In order to fulfill needs and customs, space must be available for the main basic, everyday tasks and activities necessary to be carried out in houses to maintain and support normal daily life, according to local customs and behavior, as in sleeping, eating, and sanitary functions, e.g. waste-flushing. In order to achieve this, it is important to have a living space, sleeping, cooking and kitchen space, as well as a functioning toilet.

When these basic personal living needs are met the need for a social space emerges. Since most eastern people tend to have strong social and extended family relationships, many routine gathering events are usually organized inside the Javanese houses, and therefore, a communal meeting space for get together is also very important.

**Safety and Security**

Following the physical issues, safety and security are the next issues to be considered. In order to provide maximum safety and security to its inhabitants, housing structures should offer appropriate protection from potential disasters. An earthquake is the most deadly threat even though other natural phenomena also exist, e.g. tsunami, volcanic eruption. The island of Java, in general, is under threat by the proximity of the nearby 'ring of fire', where the Eurasian and Australian continental plates meet, as a result of which, some 20 earthquakes rock various parts of Indonesia every day (Furne W.2000).

To prevent this issue from resulting in a disaster, appropriate building structures should be constructed in the area. Light structural systems using timber or steel are preferable, although heavy concrete construction is also acceptable provided that the structure is compatible with the statutory quake-proof requirements. Unfortunately, however, in order to meet these requirements, it is harder and more complex to construct as compared to a light structure, and requires the knowledge of a professional.

In order to feel secure, it is important to have a peripheral or boundary structure in a dwelling. A wall is usually useful for this purpose, although it does not always need to be of massive construction, in respect of the need to consider the safety of materials used in the event of an earthquake. Walls and other building elements, such as the roof and ceiling material should be constructed using light materials.

**Utility and Comfort**

The complementary issues of utility and comfort are the last aspects to be considered, but the cannot be seen as the least. The most important issue is how sanitary systems can be integrated into wet rooms such as bathroom, WC, and kitchen. The absence of an appropriate, functioning system can easily affect the physical and mental well-being of the user. There should be a treatment for sanitary waste and other waste water in the house. Since the most crucial aspect for comfort in a tropical area is good air circulation, cross ventilation is the most efficient and effective technique for houses. Sufficient day light is also needed to achieve a comfortable living space. These two issues are possible to resolve by ensuring that there is a door or a window in every room.

The second examination applied to the assessment of the quality of the housing is carried out by determining how the housing achieves the integration of local/cultural necessities or preferences which are compiled all aspects above. Similarly, positive and negative scoring has also

### Table 5. Quality scoring applied to Javanese housing types

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Performance requirement</th>
<th>Acceptability criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation: avoid direct sunlight</td>
<td>North South direction</td>
<td></td>
</tr>
<tr>
<td>Layout: close open room combination</td>
<td>Multi-storey building design/arrangement</td>
<td></td>
</tr>
<tr>
<td>Forms: based on climate of excessive rain and sun</td>
<td>High pitched roof with overhang</td>
<td></td>
</tr>
<tr>
<td>Volume: ideal air circulation</td>
<td>High roof, high room volume</td>
<td></td>
</tr>
<tr>
<td>Space: available for main activities</td>
<td>Available in living room, bedroom, kitchen, and, bath room WC</td>
<td></td>
</tr>
<tr>
<td>Structural system: safe from earthquakes</td>
<td>Light slender or steel structure</td>
<td></td>
</tr>
<tr>
<td>HVAC: frequent air circulation</td>
<td>High roof, high room volume</td>
<td></td>
</tr>
<tr>
<td>Materials: avoid injury</td>
<td>Light roofing material, light wall material</td>
<td></td>
</tr>
<tr>
<td>Sanitation: proper clean sanitation</td>
<td>Proper bathroom and WC system</td>
<td></td>
</tr>
<tr>
<td>Comfort</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Changes of Quality in Javanese Houses Noor Cholis Idham, Ibrahim Numan & Munther Mohd
been used to mark either the house compatible or not by assessing ten performance requirements applied, based on four main aspects (climatic adjustment, space function, safety and security, utility and comfort) (see table 4). This point system is based on the field study in which some samples had been identified. A positive indicator is applied if, in general, (more than 50% of the samples) meet the criteria. As a result, the quality level can be seen as a cumulative percentage in all aspects examined. Furthermore, a comparison of housing types can be carried out in order to review those which are of higher and lower quality (see table 5). This method is useful in terms of understanding which aspect of quality is present or absent from time to time in each housing type. Thus any negative general trend in the change in quality can be reversed instantly.

From table above, it can be deduced that:
- Overall, the housing quality has decreased over time
- Purely traditional housing (PT) has the highest quality whilst the Foreign Culture housing (FC) has the lowest quality.
- Older houses (PT, OC) lack the sanitation and comfort, as confirmed by the lack of these aspects found in the samples
- Newer houses (NC, RH and FC) lack the climatic adaptation and form-function consideration.
- All house forms are mostly accepted except those from a Foreign Culture (FC) since they do not suit the climate.
- All housing structures are mostly accepted except Old Culture (OC) which has an inappropriate structural system, and a weak, masonry wall bearing system.

CONCLUSIONS REMARKS

Javanese housing is comprised of all housing types: traditional, old culture, new culture, and post earthquake housing. All the houses differ in many aspects starting with their history, the materials used, their structure, form, and even their inhabitants/residents. They cannot be classified as a single housing group. To examine them means comparing each to the other in respect of the aspects/ issues requiring study.

The Javanese vernacular housing is the housing developed and used by people without the support or involvement of a professional designer or architect. It consists of traditional, old culture, and new culture housing. Since Java has a long history and has been affected and influenced by many civilizations, the vernacular house in Java is driven by many traditions belong to old indigenous civilizations, European colonialization, post-independence and contemporary modern-day influences and pressures. Because of the clear and often urgent need for housing, the high density population in Java, the relatively open minded Javanese people, have adapted to all these influences with relative ease.

When an earthquake strikes, almost all types of housing, without exception, will be damaged to a certain degree. Masonry/brick built housing structures, which belong to the old culture housing construction style, which is influenced by the Dutch Colonial form are usually the worst affected, whilst wooden structures belonging to the pure, local tradition are often least affected. Light structural systems, such as wooden housing, is much better in earthquake prone regions, in terms of providing safer houses for the population.

According the quality result, Javanese houses are considered only in certain aspects. The older houses which are comprised of purely traditional and old culture type structures give more consideration to space quality and are, therefore, larger,
whilst the newer houses, which constitute new culture and post earthquake housing structures, pay more attention to material quality. The application of modern materials and construction technique has increased the structural quality and building safety. However, in the same time it decreased the consideration of environmental and traditional aspect. As a result, in general, the quality of the new housing has not increased compared to the older housing. This is understandable since the new housing, constructed in post disaster periods is subject to all the limitations of finances and resources. Since people can continue development afterward, to some extent, their actions will either result in improved or reduced quality. The development of the structural system should be the main focus of attention by those people who choose to continue the development of their housing at a later date since they do not all know how to construct safe housing.

The outcome is that the changes in the types of Javanese houses have directly affected the quality of the houses. Unfortunately, the development of the various housing types and structures does not automatically correlate to an increase in the quality of the housing in question. This deterioration in quality started in Dutch colonial times when wooden based houses were altered to earthen based houses. This change was maintained until recently. Currently, Portland cement is broadly used as the main construction material. Experience gained from earthquake disasters has not to date apparently been sufficient to initiate a re-assessment, and review in respect of the potential advantages offered by the safer older houses.

This study however, only assesses the level of quality of the various Javanese housing types by general examination based on the certain method and objective judgments. Whilst the outcome is useful in respect of illustrating the changes in the quality of the housing, future studies of housing quality in respect of a specific aspect or by involving the inhabitants is most definitely required in order to provide and more detailed result.

REFERENCES


FURNE, W, 2000, Indonesia world’s most earthquake-prone country, The Jakarta Post, August 14th, p.1


HUD, Housing Quality Standard, from Housing Choice Voucher Program Guidebook URL: http://www.nls.gov/offices/adm/hudclips/guidebooks/7420.10G/7420g10GUID.pdf November 3rd, 2009


IDHAM, N and AKSUGUR, E, 2006, The Natural Acclimatization Of Javanese Vernacular Houses


ISMUNANDAR, K, 1993, Joglo rumah tradisional Jawa, Semarang: Dahara Prize (in Indonesian)

JRF, 2008, Two Years after Java’s Earthquake and Tsunami: Community Based Reconstruction, Rising Transparency, Ongoing Report Java Reconstruction Fund (JRF) 2008


SINAR HARAPAN 2007, URL: http://www.sinarharapan.co.id/berita/0704/04/hib08.html , accessed on December 20th, 2009

TAS N, et.al, 2007, A qualitative evaluation of the after earthquake permanent housing in Turkey in terms of user satisfaction—Kocaeli, Gundogdu Permanent Housing model, Building and Environment 42 2007; 3418–3431


Authors’ Addresses:

Noor Cholis Idham
Institute of Graduate Studies and Research, Eastern Mediterranean University, North Cyprus
noor.idham@emu.edu.tr

Ibrahim Numan
Faculty of Architecture, Eastern Mediterranean University, North Cyprus
ibrahim.numan@emu.edu.tr

Munther Mohd
Department of Architecture, Eastern Mediterranean University, North Cyprus
munther.mohd@emu.edu.tr
OVERALL QUALITY OF URBAN LIFE AND NEIGHBORHOOD SATISFACTION:
A Household Survey in the Walled City of Famagusta

Derya Oktay & Robert W. Marans

Abstract
This study aims to identify key indicators affecting the residents’ perception of overall quality of urban life in the Walled City of Famagusta, the historic core of the city, which reflects a decaying socio-spatial quality. The paper first presents a brief overview of the research methodology and then analyses the results from a household survey carried out in the Walled City, in order to provide a sheer understanding of people’s feelings about their neighbourhood environment and the overall urban quality of life in case of implementation of a possible regeneration scheme for the area. The research contributes some empirical evidence to verify the claimed benefits and shortcomings in terms of effects of neighbourhood satisfaction, sense of community, sense of belonging, neighbourhood attributes, use/evaluation of cultural and recreational opportunities and safety on the overall quality of urban life of the residents, as well as to identify the predictors of the neighbourhood satisfaction.

Keywords: Walled City of Famagusta, Quality of Urban Life, Neighborhood Satisfaction, Sense of Neighbourhood As Home, Sense of Belonging, Neighbourhood Attributes, Use/Evaluation of Cultural/Recreational Activities, Safety.

INTRODUCTION

An underlying purpose of any environmental evaluation should be to develop a better understanding of how the physical environment or place contributes to or impedes the goals of the individuals or groups who must operate within them. Specifically, the research should attempt to clarify and supplement what is presently known about relationships between both the physical environment and its specific attributes and people’s behaviors and subjective responses to that environment (Marans & Spreckelmeyer, 1981).

During the last few decades, measuring the perceived qualities of urban life and residential environments have been significant areas of inquiry for housing environment research. The Famagusta Area Study (FAS) is one of those survey studies, through which objective and subjective measures of quality of urban life and neighbourhoods have been compiled using face-to-face interviews in 398 households in the spring and fall 2007.

In this paper, the results from a survey of the adult population in the historic core of the city of Famagusta will be analysed in order to understand their overall evaluation of the quality of urban life and the degree of satisfaction with their neighbourhood which reflects a decaying socio-spatial quality. In addition, the role neighbourhood attributes (such as accessibility, attractiveness of the place, appropriateness as a place to live, availability of things to do, appropriateness as a place to raise children, cleanliness, noise level and traffic intensity), the use and evaluation of the cultural and recreational activities, and safety might play on the overall satisfaction will be questioned.

LITERATURE REVIEW

Building on the working of Campbell et al. (1976), Marans and his colleagues began to explore the...
issue of quality of housing environments from a conceptual and empirical perspective (Marans, Rodgers, 1975; Lee, Marans, 1980; Connerly, Marans, 1988). It was asserted that quality of a place or geographic setting (city, neighbourhood, dwelling) was a subjective phenomenon, and that each person occupying that setting may differ in his/her views about it. Furthermore, those views would reflect their perceptions and assessments of a number of setting attributes that could be influenced by certain characteristics of the occupant, and his or her needs and past experiences (Marans, 2005).

As Francescato (1998: 484) stated, there is often a need to assess how well a residential environment meets the requirements, goals, and expectations of its inhabitant - that is how satisfied they are with it. In broad terms, any such assessment may be viewed as an indicator of residential satisfaction. More specifically, residential satisfaction indicates people's response to the environment in which they live. In this context, the term 'environment' refers not only to physical aspects of residential areas, such as dwellings, dwelling environments, and neighbourhoods, but also to social, economic, and even organizational aspects, if any.

The most explicit definitions of community attachment are proposed in the literature on place attachment where place attachment is defined as an affective bond between people and place or setting (Tuan 1974). This basic definition has been extended by other researchers to include a person's perceptions and feelings. In line with this, place attachment can be defined as the effective positive bond between a person and a place that embodies an emotional content; more specifically, a strong tendency of that person to maintain closeness to such a place (Hidalgo and Hernandez 2001: 274). In most of the publications, place attachment is considered an integral part of human identity (Jörgensen & Stedman, 2001; Low & Altman, 1992; Mazumdar, Mazumdar, Docuyanan, & McLaughlin, 2000; Stedman, 2002; Stewart, Liebert & Larkin, 2004; Twigger-Ross & Uzzell, 1996) or is used interchangeably with concepts directly referring to identity, such as 'place identity' or 'community identity'. Place attachment is also assumed to be beneficial for the neighborhood since it facilitates involvement in local affairs, and therefore serves both the individual and larger community.

According to Connerly and Marans (1985), it is possible to distinguish satisfaction from attachment in terms of the degree to which each taps the cognitive and affective quality of life components. Because neighbourhood satisfaction is thought to be linked to the evaluation of specific neighbourhood attributes, relative to one's expectations, it is therefore expected that it will primarily tap the cognitive component of well-being.

It is postulated in this paper that satisfaction with neighbourhood, and the two measures of attachment, sense of neighbourhood as home and sense of belonging, are the three social/emotional measures which have an important influence on the overall quality of respondents' lives. It is also hypothesized that certain attributes of the neighbourhood, along with residents' ability to participate...
in the cultural and recreational activities, satisfaction with local recreational areas, and satisfaction with local safety have influences on the overall quality of urban life (QOUL).

THE RESEARCH CONTEXT

The case
The city of Famagusta (Gazimagusa in Turkish), the second largest city of the Turkish Republic of Northern Cyprus, with a historic core but also with a harbour, has a population of 35,381 (TRNC 2006 Population & Dwelling Census). The city was an important trade and tourism centre and served as a regional centre before the division of the island in 1975. Today, despite some restrictions on its capacity owing to the new circumstances of the island, the harbour still plays an important part in the trade activities of the northern region. In addition to the port, the Eastern Mediterranean University (EMU), with a student population of nearly 15,000 from 67 different countries (in addition to the de-facto population), has been a major factor in the overall economic and social structure of the city in the last few decades. Today, Famagusta accommodates a wide diversity of residents, including the local Turkish-Cypriots, the immigrants of 1974 coming from the southern part of the island and different parts of Turkey, and university staff and students from many countries (Oktay 2005).

The Walled City of Famagusta
The history and urban development of Famagusta date back to the first century AD. As a historical town, it has changed many hands at different historical intervals. Founded in circa 648-1192 AD it came under Lusignan rule in 1192 until 1489. Other periods that followed are the Venetian period (1489-1571), the Ottoman period (1571-1878) and the British period (1878-1960). Cyprus gained its independence from Britain in 1960 and under self-rule until the events of 1974 which brought about the division of the island into two separate states. During the Ottoman era the non-Muslim population of the city vacated to the outskirts of the town. This was clearly the beginning of spatial segregation of the two dominant communities: the Greek Cypriot community and the Turkish Cypriot Community. The Greek Cypriots disengaged to what are known as the Varosha (Maras) and Kato Varosha (Asagi Maras) areas south of the walled city. Consequently, the city's growth took a turn towards the north (Doratli et al 2001; Oktay 2005; Oktay and Conteh 2007). The surplus housing stock left vacant by the flight of the Greek residents was eventually filled by the settler population from Turkish Anatolia and the refugees from the southern part. Although, as to be expected, the demographics of the island had changed drastically in the period immediately after the war, the spatial configuration did not change much.

As explored in the first author's previous studies (Oktay 2001, Oktay 2002), until the deterioration of traditional life, the concept of neighbourhood (mahalle in Turkish) was very important in the Walled City like elsewhere in Northern Cyprus and Anatolia. Neighbourhood was not only a physical entity within the city but also a social unit providing social and economic collaboration among neighbours. Since it was a very compact community, neighbourhood cohesion was very strong and widespread; families were concerned with their neighbours and neighbourhoods. In this context, connecting a group of houses with each other and to a larger circulation artery, the street was the most rudimentary of intersections between the private and public domains.

Although the Walled City of Famagusta, with its organic form, was declared a Conservation Area, the measures undertaken for its conservation and revitalization have not led to the attainment of a satisfactory state in terms of cultural or economic sustainability, so the area is functionally isolated from the other parts of the city. The isolation was augmented following the uncontrollable urban sprawl in the north of the city due to the lack of a master plan, the so called 'boom' in construction activities after the Annan Plan, and the uncertainty associated with the abandoned Varosha district in the south.

Today, the Walled City of Famagusta accommodates a population of 2,026 (TRNC 2006 Census), and this shows a 12.5 percent decline comparing to the population in 1996. The population of the Walled City makes about 18 percent of the whole city.

3 The male population in particular has decreased drastically (24 percent) (KKTC-DPO Website www.devplan.org).
STUDY METHODOLOGY

Data for this study come from a sample of housing units selected from Famagusta neighbourhoods. Within each housing unit, a resident was selected and interviewed by trained graduate students. The interviews were conducted in the spring and fall 2007 (Oktay 2009).

The sample

The survey was conducted among housing units in Famagusta using a multistage sampling procedure. First, the total number of housing units (13,455) within the city limits was determined by counting the parcel plots. As Map 1 reveals, eight neighbourhoods of the city were identified and housing units with each was randomly selected from each neighbourhood. The number of household units for each district was calculated considering the proportion of the number of dwellings to the total population. A total of 540 units was selected. Contacts were made with each housing unit and resulted in 398 completed interviews resulting in a 75 percent response rate. This paper summarizes survey results covering 37 respondents living in Famagusta’s Walled City. Respondents included local residents as the dominating group (76 percent), immigrants from Turkey (18 percent), and university students from Turkey (6 percent).

The interview schedule

The Famagusta Area Study, titled “Measuring the Quality of Community Life in Famagusta” is a part of an International Research Program on Quality of Life coordinated by the University of Michigan, USA. The interview schedule included questions that tap at people’s feelings and behaviours in reference to their households and their attributes. As the city population is of international character, the survey booklets were prepared both in Turkish and English.

The survey framework for Famagusta Area Study (FAS) was closely related to that of the Detroit Area Study (DAS) 2001 model. However, as quality of life considerations are not universal and are likely to vary from one city to another (Mazumdar, 2003), local cultural relativity of certain ideas were highlighted through modifications in the survey questions. In this study only a portion of the questions were employed. In addition to demographic variables, the schedule had questions on residential history, public services and transportation, schools, parks, recreation and children’s play environments, shopping, community participation and involvement, neighbourhood and neighbouring, housing and residential mobility, safety, health and health care facilities, and people’s perceptions of quality of urban life.

FINDINGS

Satisfaction with neighbourhood

In exploring the overall neighbourhood quality, respondents were asked the question “How satisfied are you with the overall neighbourhood quality?” by

<table>
<thead>
<tr>
<th>How satisfied are you with your neighborhood in general?</th>
<th>Walled City</th>
<th>City of Famagusta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very dissatisfied</td>
<td>5.4</td>
<td>6.8</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>13.5</td>
<td>17.8</td>
</tr>
<tr>
<td>Neither satisfied nor dissatisfied</td>
<td>13.5</td>
<td>24.9</td>
</tr>
<tr>
<td>Satisfied</td>
<td>64.9</td>
<td>57.2</td>
</tr>
<tr>
<td>Very satisfied</td>
<td>2.7</td>
<td>9.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Neighbourhood Satisfaction Index

| Standard Deviation | 3.46 | 3.54 |

*Table 1. Overall satisfaction with the neighbourhood (Percentage distribution)*

It should be noted that findings covering respondents in the Walled City are rough approximations of how the total population of residents thinks and behaves. That is, the statistics covering the 37 respondents are subject to relatively large sampling errors or approximately 16%. For instance, if 45% of the respondents said they liked their neighbours, the true value for all Walled City residents would be somewhere between 29% and 61%.

The Detroit Area Study (DAS), which was organized by scholars at the University of Michigan (2001) as a revised larger application of studies started in the beginning of 1950s, is among the best known examples of studies that focus on assessing the quality of urban life in the United States of America.
taking into consideration physical (built and natural) and social dimensions. On a scale of 1 being the most negative response and 5 being the most positive response, results indicate that the majority of the Walled City respondents (67%) are satisfied, one-fifth (19%) are dissatisfied, and a smaller group (14%) are neither satisfied nor dissatisfied (Table 1). As the neighbourhood satisfaction indexes (mean scores) show, the differences between these values and the average rating for the overall sample are small and statistically insignificant.

**Sense of neighbourhood (mahalle) as home**
Feelings about overall sense of community were measured through a single question of “Do you think of this neighborhood ‘your home’ or ‘just a place you happen to live’? In total, more than half of the respondents (57%) agreed that there was a good sense of community while the rest (43%) disagreed (Table 2). The indexes for the sense of neighbourhood as home for the Walled City and the overall sample are almost equal.

**Sense of belonging**
In order to get a feel of personal belonging and closeness to neighbourhood ties, respondents were given some statements about neighbours and neighbourhoods and asked to say whether they strongly agree, agree, neither agree nor disagree, disagree and strongly disagree. The main statement was: ‘I can't feel I belong to this community’. In terms of belonging, respondents were divided. 43 percent appear to have some feeling of belonging to their neighbourhood, 40 percent do not feel they belong to their neighbourhood, and 16 percent do not have a clear idea (Table 3). The difference between the results of the Walled City and the overall sample is not significant.

**Neighbourhood attributes**
Various physical, urban/environmental and social attributes, and residents’ views of these attributes are reflected upon the neighbourhood satisfaction. In exploring overall neighbourhood quality, respondents were asked to describe their environment as it appeared to them by ranking a number of indicators on a scale of 1-5 with 1 being the most negative response and 5 being the most positive response. In the scope of this paper, responses to a number of questions in relation to the following attributes were examined:
- **Urban/environmental attributes**: accessibility, attractiveness of place
- **Social attributes**: appropriateness as a place to live, appropriateness as a place to raise children, availability of things to do
- **Physical attributes**: cleanliness, noise level, and traffic intensity

### Table 2. Perception of sense of neighborhood (mahalle) as home (Percentage distribution)

<table>
<thead>
<tr>
<th></th>
<th>Walled City</th>
<th>City of Famagusta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meets your needs?</td>
<td>56.9%</td>
<td>58.5%</td>
</tr>
<tr>
<td>Just a place you happen to live</td>
<td>43.2%</td>
<td>43.1%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

### Table 3. Sense of belonging (Percentage distribution)

<table>
<thead>
<tr>
<th></th>
<th>Walled City</th>
<th>City of Famagusta</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can't feel I belong</td>
<td>2.1%</td>
<td>1.6%</td>
</tr>
<tr>
<td>I strongly agree</td>
<td>37.3%</td>
<td>32.5%</td>
</tr>
<tr>
<td>I agree</td>
<td>43.2%</td>
<td>40.0%</td>
</tr>
<tr>
<td>I neither agree nor</td>
<td>13.2%</td>
<td>14.9%</td>
</tr>
<tr>
<td>I disagree</td>
<td>14.9%</td>
<td>12.1%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

**Urban/environmental attributes**

**Accessibility**
Considering accessibility, more than half (59%) of the respondents in the Walled City found it easy to get around, while almost one-third (32%) found it fairly accessible, and only a small percentage (8%) found it difficult to get around. These rankings could be considered positive comparing to the average value for all Famagusta neighbourhoods.

**Attractiveness of the neighbourhood**
Considering attractiveness of the neighbourhood, more than half (57%) of the respondents felt positive about the attractiveness of their living environment, while more than a quarter (27%) felt that their environment was neither attractive or unattractive, and less than one-fifth (16%) were negative.

**Social attributes**

** Appropriateness as a place to live**
In terms of appropriateness as a place to live, findings reveal that a majority of respondents (65%) felt that they lived in an appropriate place, one-fifth (21%) felt that they lived in an inappropriate place,
and a minority (14%) was neutral. These values are slightly higher than the average value at the city level (56% positive).

Appropriateness as a place to raise children
In terms of appropriateness as a place to raise children, the majority of the respondents (62%) thought their neighbourhood is a good place to raise children, while one-fifth (22%) were negative, and a small group (16%) were neutral. These ratings are comparable to ratings at the city scale (58%).

Availability of things to do
Almost half (49%) of the respondents felt that their neighbourhood environment did not provide them with enough to do, while more than a quarter (27%) felt neutral, and a quarter (24%) were positive. Although these values are slightly better than the average values for the overall sample, the level still remains low.

Physical attributes
Cleanliness
In terms of cleanliness of the neighbourhood, a significant portion of the respondents (41%) found their neighbourhood environment dirty, an equal percentage (41%) gave a neutral response, and only about one-third (19%) found it clean. These ratings are lower than the average ratings on cleanliness for the overall sample.

Noise level
The responses were more negative in terms of noise level. Half of the respondents (51%) found their neighbourhood noisy compared to perceptions of noise (34% negative) for the overall sample.

Traffic intensity
In terms of traffic intensity, respondents were concerned about the intensity of traffic. Half of them (49%) found the traffic in their neighbourhood heavy, and this is in agreement with the responses to traffic (48%) by respondents in all neighbourhoods.

Use/Evaluation of cultural/recreational activities
Participation in the cultural and recreational events
Since participation in the cultural and recreational events is one indicator of quality of urban life, respondents were asked whether or not they attended a cultural and recreational event during the past 12 months. Findings indicate that nearly half (44%) of the Walled City respondents have never attended a cultural and recreational event during the past 12 months. This result indicates a lower participation rate than that of the overall sample (32%).

Satisfaction with local recreational areas
Respondents were also asked the question “All things considered, how satisfied are you with the recreational areas available to you?”. On a scale of 1 to 5 with 5 being the most positive response, results indicate that the majority of the respondents (70%) were not satisfied with the recreational areas available to them, a quarter of the respondents (24%) were neither satisfied nor dissatisfied, and only a very small portion (5%) were satisfied (Table 4). As the satisfaction indexes show, the satisfaction with recreational areas in the Walled City is much lower than the overall sample.

Perceived safety
In terms of assessment of feeling safe outdoors in the immediate surroundings of neighborhood during the day, the great majority (89%) of the respondents expressed positive views, and this is much higher than the average satisfaction rate for the whole sample. However, respondents were divided concerning the perceived safety in the outdoor environment at night. More than half of the respondents (56%) thought it is safe outdoors at night as well.
whereas nearly half (45%) of the respondents were negative. Respondents were equally divided (50% positive and 50% negative) when the felt safety for women was concerned.

Respondents were also asked the question "how satisfied overall are you with your neighbourhood?". Responding on a scale of 1 to 5, where 1 is completely dissatisfied and 5 is completely satisfied, it appears that more than half of the respondents (53%) are satisfied, a significant portion (39%) are not satisfied, and a small portion of the respondents (8%) are neither satisfied nor dissatisfied (Table 5). All these ratings were lower than the average rating for the overall sample.

**Overall quality of urban life**

The overall quality of life in Famagusta was measured with a single question: "In general, how would you rate the overall quality of life in the city of Famagusta today?". Based on a scale of 1 to 5, where 1 is negative and 5 is positive, findings indicate that almost half (44%) of the Walled City respondents thought that the quality of life in Famagusta is neither good nor poor, more than one-third (36%) of the respondents thought it is poor, and only one-fifth (19%) thought it is good (Table 6). In this context, the mean score (average) for the overall quality of life is worse than the average of the quality of life for the whole sample.

**RESULTS**

Because of the small sample size in the Walled City of Famagusta (n=37), we present simple correlations between sense of community, sense of belonging, several attributes of the neighborhood, safety, use and evaluation of cultural and recreational opportunities and 1) quality of urban life and 2) neighborhood satisfaction (Figures 3a-4a; Table 7). First, we were surprised to see that for the Walled City respondents (as well as for the overall sample) there is no relationship between neighborhood satisfaction and quality of urban life. Second, the only items that affect both neighborhood satisfaction and the QOUL are feelings about safety and feelings about cleanliness; and third, feelings about noise level (as the strongest) and sense of belonging are other predictors of QOUL. The find-
ings also indicate that QOUL for the Walled City respondents is not associated with their perceived attractiveness of the neighborhood, and sense of community although these two aspects have strong relations with the satisfaction with their neighborhood. Appropriateness as a place to live and appropriateness as a place to raise children are both significantly related to neighborhood satisfaction as well (Figures 3b-4b).

The worst ratings were achieved regarding the physical attributes of the neighborhood. Noise level, cleanliness and traffic intensity are all rated negatively by a significant number of respondents (at least 40 percent). The social attributes, namely appropriateness as a place to live and appropriateness as a place to raise children, were rated positively by the majority, and urban/environmental attributes were rated positively by more than half of the respondents. Despite the reflection of negative feelings regarding the physical attributes and lacking neighborhood facilities, a significant group of respondents were satisfied with their neighborhood owing to their somewhat sufficient sense of community and sense of belonging, their relatively more positive feelings about quality of the neighborhood as a place to live and the quality of the neighborhood as a place to raise children.

**DISCUSSIONS AND RECOMMENDATIONS**

This paper has investigated the degree of satisfaction with quality of urban life and satisfaction with neighborhood among residents living in the Walled City of Famagusta. The study aimed to contribute some empirical evidence to verify the claimed benefits and shortcomings in terms of

---

**Table 7. Correlations between perceptions of neighbourhood, overall quality of urban life, and neighbourhood satisfaction (Percentage distribution)**

<table>
<thead>
<tr>
<th></th>
<th>Overall QOUL</th>
<th>Neighbourhood Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sense of community</td>
<td>.23 (ns)</td>
<td>.48**</td>
</tr>
<tr>
<td>Sense of belonging</td>
<td>.33*</td>
<td>.18 (ns)</td>
</tr>
<tr>
<td><strong>Urban/Environmental attributes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessibility</td>
<td>.12 (ns)</td>
<td>.31*</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>.19 (ns)</td>
<td>.55**</td>
</tr>
<tr>
<td><strong>Physical attributes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleanliness</td>
<td>.37*</td>
<td>.46**</td>
</tr>
<tr>
<td>Noise level</td>
<td>.42*</td>
<td>.3 (ns)</td>
</tr>
<tr>
<td>Traffic intensity</td>
<td>.21 (ns)</td>
<td>.03 (ns)</td>
</tr>
<tr>
<td><strong>Social attributes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriateness as a place to live</td>
<td>.07 (ns)</td>
<td>.49**</td>
</tr>
<tr>
<td>Appropriateness as a place to raise children</td>
<td>.13 (ns)</td>
<td>.55**</td>
</tr>
<tr>
<td>Availability of things to do</td>
<td>.16 (ns)</td>
<td>.23 (ns)</td>
</tr>
<tr>
<td><strong>Use/Evaluation of cultural and recreational opportunities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation in cultural/recreational events</td>
<td>.04 (ns)</td>
<td>.20 (ns)</td>
</tr>
<tr>
<td>Satisfaction with cultural/recreational areas</td>
<td>.00 (ns)</td>
<td>.08 (ns)</td>
</tr>
<tr>
<td>Safety</td>
<td>.36*</td>
<td>.43**</td>
</tr>
<tr>
<td>Neighbourhood satisfacation</td>
<td>.17 (ns)</td>
<td></td>
</tr>
</tbody>
</table>

* = significant at 5% level
** = significant at 1% level
effects of neighbourhood satisfaction, sense of
neighbourhood as home, sense of belonging,
neighbourhood attributes, use/evaluation of cultur-
al and recreational opportunities and safety on the
overall quality of urban life of these residents, as
well as to identify the predictors of the neighbour-
hood satisfaction.

Since there is no relationship between neigh-
borhood satisfaction and the QOUL for the Walled
City residents, and the degree of their satisfaction
with the QOUL is lower than that for the overall
sample, strategies should be developed to integrate
the Walled city residents with the other urban areas
in order to help them benefited from the available
urban facilities while making efforts to increase their
overall QOUL in the city. In this context, the level of
noise, cleanliness, safety, and sense of belonging,
in order of significance, should be the major con-
cerns in future urban policy and management. The
level of noise and the cleanliness in particular need
serious attention as they were rated more negative-
ly by a significant percentage of respondents and
these issues also have strong relations with neigh-
bourhood satisfaction. Although the degree of sat-
fisfaction with local safety is not too low, it is still
lower than the average score for the overall sam-
pole, and should therefore not be neglected in the
future urban policy and management.

As the majority of the Walled City residents
have low-to-middle income level and low mobility6,
their neighbourhood may mean a 'world' to them.
Therefore, the aspects which have strongest rela-
tions with neighbourhood satisfaction should be
seriously taken into consideration in the further pol-
icy and applications. These aspects are attrac-
tiveness, appropriateness as a place to raise children,
sense of community, appropriateness as a place to
live, sense of community, cleanliness, safety, and
neighbourhood as home, in order of significance.

This paper has investigated the degree of
satisfaction with quality of urban life and satisfac-
tion with neighbourhood among residents living in
the Walled City of Famagusta.

ACKNOWLEDGEMENTS

Famagusta Area Study was funded by the Scientific
and Technical Research Council of Turkey
(TUBITAK) for the period of 15 September 2006
-15 October 2008, and is placed under the aus-
pices of the Urban Research & Development Centre
(URDC) of the Eastern Mediterranean University,
TRNC.

* In the Walled City, the average monthly income for the 20% of the respondents is less than 850 YTL ($580). The percentage
of households who do not own a car is 48%, while the average (mean score) for the overall sample is 2.04.
REFERENCES


Authors’ Addresses:
Derya Oktay, Ph.D
Director, Urban Research & Development Center
Eastern Mediterranean University
Famagusta, N. Cyprus
derya.oktay@emu.edu.tr

Robert W. Marans, Ph.D.
Research Professor
Institute for Social Research
University of Michigan
Ann Arbor, USA
marans@umich.edu
A USER REQUIREMENTS STUDY OF DIGITAL 3D MODELS FOR URBAN RENEWAL

Sisi Zlatanova, Laure Itard, Mahmud Shahrear Kibria & Machiel van Dorst

Abstract
Urban renewal is a multifaceted activity that involves numerous actors, software, and types of data. Design communication tools play an important role in this process. Visual information helps to outline, understand, and choose sustainable solutions for problems in the design, while visual tools should be able to diminish professional differences and establish a common language. Recent 3D geo-technologies offer a great variety of new tools that significantly enrich visualisation possibilities and allow for flexible switching between different 3D representations. However, studies have indicated that particular representations create different perceptions in professional compared to non-professional individuals. This paper discusses the specifics of urban renewal processes in the Netherlands and investigates recently developed 3D geo-information technology, and more specifically multiple 3D representations, that can support this task. The concept of LOD, which uses five levels of information, was evaluated as a very promising approach to agree on abstractions and representations in the different renewal phases. The study did not reveal a lack of digital possibilities for visualisation, but instead showed that the simultaneous visualisation of the proposed alternatives should be a priority. This investigation did reveal that different levels of interactivity could be used for the presentation and communication of project alternatives.

Keywords: Visualisation, Interaction, 3D, LOD, CityGML.

INTRODUCTION

Urban planning is a complex decision-making process that involves social, spatial, economic, technical, and organisational models with a large number of actors that interact during this process (Bourdakis 1997, Klaasen 2004, Mayer et al 2005). Urban renewal has a growing significance worldwide, particularly in the European Union, because of the large proportion of building stocks that should be updated (Mayer et al 2005, Edwards 2008). Post-war neighbourhoods often fall short of fulfilling current requirements, and consequently are being renovated on a large scale.

Previous studies have indicated that sustainable urban renewal should include participative design strategies (Tjallingii 1995, Conte & Monno 2001, Van Dorst 2005). A participative approach to urban renewal design should allow for consideration of the different perceptions and aims of all stakeholders. Participation should lead to a broader acceptance of the renewal plan, and, therefore, to a better involvement of inhabitants in their respective neighbourhoods. In a strategy of participation, the aims are shared ambition, perception, comprehension, and responsibility (Checkland 1999, De Bruijn & Ten Heuvelhof 2000, De Bruijn et al 2002, Eijk 2002). Several studies have investigated participatory planning and design (Al-Kodmany 2001, Bendixen 2007, Luck 2007, White et al 2007), but were not focused specifically on urban renewal. The level of participation depends on the design process, which can vary from a blueprint planning to an open planning process. The six components for successful interactive spatial planning that have been identified are the following: actors (stakeholders), planning phases, participation level, communication protocol, interface, and visualisation (Hoogerwerf et al 2006). The participation level of actors can be further subdivided into informing, consulting, advising, co-producing, and co-deciding (Dalal & Dent 1993). While the actors, planning phases, and participation level may be relatively specific to the particular country, the remaining factors (communication protocol, interface, and visualisation) are closely related to the employed technology. Visualisation and interface (or interaction) should support the behaviour and
social framework of actor participation (Ewebstein & Whyte, 2007).

Traditionally, municipalities used 2D paper maps, CAD drawings, graphical images, textual/oral information, and physical 3D models to present ideas and alternatives to citizens. Most municipalities have websites for the dissemination of spatial plans, but these are most often 2D maps with static visualisation. Large municipalities have only recently employed systems that allow for the presentation of interactive digital maps to the public in Web Map Services (WMS) (Knapp & Coors 2008). Advances in geo-information and visualisation technology, such as 3D virtual environments, 3D analytical visualisation, and 3D formats for data sharing, offer a large spectrum of new possibilities for the communication of ideas and discussion of design alternatives (Mayer et al 2005, Batty et al 2000, Zlatanova 2000, Bodum 1999, De Vries & Achten 1998). Virtual environments, which include Google Earth and Virtual Earth, have made 3D visualisation known and accessible worldwide. CityGML has been accepted as the standard for representing 3D city models and has been developed from data exchange file format to a data model. Many municipalities have created 3D city models using CityGML or proprietary software (Cebra 2010), but these models are often not actively used for urban planning and renewal.

Due to the aforementioned complexities of this process, our hypothesis was that geo-information technology (3D digital models and appropriate interaction with the models) would promote flexible communication and the exchange of ideas (data and models). The large amounts of static physical models, booklets, other printed materials, animations, and dedicated software for public participation could be replaced with more dynamic and interactive visualisation tools, which are based on 3D multi-resolution models and a set of interaction tools. Therefore, the major questions that were investigated during this study are the following:

- Which computer-generated models (i.e. LOD of CityGML) are suitable for the different phases of urban renewal?
- Which interaction level is sufficient for the different actors to discuss and communicate design alternatives?

To address these questions, different types of visualisation materials and levels of interaction were discussed with 30 participants from seven different cities. This study included design professional (urban planners, housing companies, and architects) and non-design professionals (municipality). Citizens did not directly participate in the questionnaire, but the municipalities were requested to provide opinions on the level of interaction that would be appropriate for citizens. The largest group of the population was urban planners (17), followed by architects (6), municipality offices (5), and urban design firms (2). Additionally, separate interviews were conducted for nine relatively experienced urban planners (called experts) from two large (Rotterdam and Den Haag) and two small municipalities that had been involved heavily in renewal projects.

The study presented herein is outlined as follows: Section 2 discusses the urban renewal process in Dutch municipalities and defines major actors, Section 3 outlines relevant 3D visualisations and tools for interaction, and Section 4 includes a discussion of the results. The last section focuses on geo-information technology that can be utilised to provide functionality and visual materials.

USE CASE: URBAN RENEWAL IN THE NETHERLANDS

The Dutch system has a high degree of consultation and participation opportunities in comparison to other countries (Newman & Thornley 2006). A municipality typically instates a decision for renewal, but demands may come from housing agencies and even groups of citizens. The goal of a renewal project is to improve living conditions with respect to the following criteria: overall space arrangements (e.g. projection from wind, sun/_shadow, or noise), housing, transportation, shopping, school facilities, green areas, water, and energy suppliers. Hence, the process starts with a large investigation of the existing situation, citizen requirements, and problems to be resolved towards sustainable development. In this respect, urban renewal can be viewed as a complex bottom-up process that requires a high degree of interaction and diverse methods for comparing and evaluating renewal variants against the existing situation. The study presented herein investigated the urban renewal situation in the Netherlands:

- We investigated six different large renewal
projects (Poptahof, Schalkwijk, Arnhem Zuid, Hoogvliet, Duindorp, and Bijlmer) in the Netherlands that have followed different approaches to share information with citizens. For example, significant social problems occurred in Poptahof and discussions of the physical environment were frequently postponed. Schalkwijk had focused on the introduction of more open water areas, which resulted in the production of many design options for water areas and limited discussions of other important elements in the architectural design. Arnhem Zuid had initiated the clearing of large areas and planners were involved only at very late stages to investigate the social problems. Duindorp is an interesting case because the renewal process was frozen for a long period due to non-acceptance from citizens. Serious miscommunication between planners and citizens contributed to the delay. These investigations revealed several areas for future research. Interaction with citizens is well represented from the beginning of the renewal process. The discussions and negotiations between citizens, the municipality, housing agencies, and architects are intensive and often face-to-face. In some cases, special workshops are organised that allow citizens to propose their own solutions.

- The renewal process typically starts with the preparation of an urban plan (i.e. detailed plan for development), followed by a specialisation urban plan (the volumetric structure of the buildings), and ends with an architectural plan (architectural details of the buildings). Most of the renewal projects are developed for one or several neighbourhoods, which preserves land-use status. Thus, these neighbourhoods are typically compliant with broader master plans.
- There must be a breadth of information available regarding the existing situation. This information ranges from reports to video materials illustrated with maps, photos, and models of the current spatial division, critical problematic areas, and other details of interests.

The urban renewal phases considered during this study were master plan, urban plan, specialisation urban plan, and architectural plan.

**VISUALISATION AND INTERACTION TECHNOLOGY**

A critical point in the study was the presentation of available technologies to the users. A classification of tools and means was provided, which could be quickly explained and easily understood. On the basis of an extended study of visualisation and interaction taxonomies, a relatively simplified classification was derived for presentation to the users.

Visualisation can be highly realistic or abstract depending on the application and/or the purpose of the visualisation. Numerous classifications can be found in the literature defining the different levels of abstraction (e.g. McCloud, 1993; Verbree et al., 1999; Kolbe et al., 2005). The study presented herein considered photo images and 2D/3D digital models. Photo images are easily perceptible to the viewer and 2D/3D models allow for the relatively straightforward preparation of alternative designs (Figure 1).

The focus of this study was on 2D/3D digital models, which can be either CAD models (representing project alternatives) or GIS models (depicting existing situation). The Level of Detail (LOD) subdivision was adopted to relax the level of abstraction, as presented in CityGML (Kolbe et al 2005). According to CityGML, LOD 0 is a 2D map and the levels are regarded as 3D models. For example, buildings in LOD 1 are block models with flat roofs; buildings in LOD2 are block models with detailed roofs, buildings in LOD3 are represented...
with all details on the façade, and LOD4 describes possible building interiors (Figure 2). CityGML were of particular interest in this study due to the increasing number of available CityGML models and the growing interest of CAD and GIS scientific societies in these respective models (Lapierre & Cote 2008, Isikdag 2006, Emgard & Zlatanova 2008).

An important aspect of using 3D digital models is the level of interaction permitted by a system. A taxonomy of interaction has been described in many previous reports (Kraar 2002, Sneiderman 1998, Sherman & Craig 2003, Wachowicz et al 2002, MacEachren et al 1999). Generally, the level of interaction depends on the hardware, but this study was limited to the use of desktop systems without elaborate hardware equipment. After thorough analysis of previously studied taxonomies (see Kibria 2008), we have defined the following levels of interaction: animation/video (predefined walk through), interaction (navigate, zoom, and manipulate), query (explore attributes of objects, e.g. area of a house or apartment), feedback (the possibility to provide an opinion), and change (edit the shape or a position of a house).

Two questionnaires were prepared to investigate the necessary user requirements. The first questionnaire was aimed at determining the needed visualisation and was organised as a matrix. The surveyed population could indicate whether a specific LOD was appropriate as a given renewal phase, which the participants could indicate with a 'yes' or a 'no'. The second questionnaire was aimed at determining the needed interaction levels and was organised as statements that the participants had to evaluate using a six-level scale (absolutely necessary, necessary, could be, don't know, not necessary and absolutely not necessary). The first three levels were considered validated (i.e. classi-
fied as ‘yes’) and the last three were not validated (i.e. classified as ‘no’). Two 3D models were created to illustrate the concepts of six visual materials. These models were imported in three virtual environments, which were Google Earth, X3D viewer, and LandXplorer (a viewer for CityGML), provided to the user (Kibria et al 2009).

RESULTS ON VISUALISATION
The types of visual materials are illustrated in Figure 2. The results of the interview are shown in Table 1.

Photo images
Photo images have been widely used throughout the entire renewal process. The photos are particularly important at the start of the urban renewal process when the social situation is discussed. Photo images from existing environments are used as illustration material in all reports of the involved institutions. The results of our study demonstrated that 40% of interviewed subjects (on average) found these images appropriate for the presentation of ideas during all phases of renewal.

Discussions with the group of experts revealed interesting observations regarding snapshots of 3D models or architectural drawings. People often focused on less important features while reviewing static images. For instance, the materials used for the buildings will be discussed, while the volume was the principal characteristic under review. As an alternative to the presentation of such images, some municipalities (e.g. in the project Duindorp) planned excursions to other neighbourhoods to demonstrate the presented plans.

LOD0 (2D map)
Design professionals (architects from urban design firms) preferred two-dimensional maps with provisional plans at the process start because these maps do not fix detailed solutions and thereby allow for an extended discussion. However, professionals doubted if two-dimensional plots are really understood by citizens. Therefore, the use of 2D plots in combination with physical models is a preferred option (interviews with experts). Our questionnaire corroborated this tendency. LOD0 is most appropriate for the master plan (76%) and the urban plan (60%). The specialisation urban plan could also be represented as a 2D map (26%), but realistic details are recommended (37% LOD1 and 57% LOD2). This is a clear indication that the 2D representations might be confusing in regards to information on vertical spaces. Although few argue for map visualisation (23%) during the last phase (architectural plan), 3D visualisation is obviously preferable (see below).

LOD1 (block model)
The block model was recognised by the experts as widely used for creating a volumetric perception and presenting new design within an existing situation. As discussed with the experts, physical (wooden or plastic) block models yield good overviews of existing situations, without focusing on the details. The details are usually known and can be mentally visualized by the actors. For example, the Den Haag municipality featured ‘design evenings’ with citizens, which involved the observation of physical block shapes that allowed citizens to design their own alternatives.

However, the digital block models seem less appealing. Discussions have revealed that the possibility for overview is mostly lost while viewing the computer screen. The interviewed participants agreed on the inclusion of LOD1 during an early stage for the master plan (73%) and later for the urban plan (57%), but use of LOD1 in the specialisation urban plan (37%) was estimated as could be used. The acceptance percentages or LOD1 slightly decreased if realistic photo textures were applied.

<table>
<thead>
<tr>
<th>Photo image</th>
<th>MASTER PLAN</th>
<th>URBAN PLAN</th>
<th>SPECIALISATION PLAN</th>
<th>ARCHITECTURAL PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOD0 (maps)</td>
<td>76</td>
<td>60</td>
<td>27</td>
<td>23</td>
</tr>
<tr>
<td>LOD1</td>
<td>73</td>
<td>57</td>
<td>37</td>
<td>17</td>
</tr>
<tr>
<td>LOD2</td>
<td>23</td>
<td>60</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td>LOD3</td>
<td>7</td>
<td>13</td>
<td>50</td>
<td>70</td>
</tr>
<tr>
<td>LOD4</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>57</td>
</tr>
</tbody>
</table>

Table 1. Results of the visualisation study (given in % of participants indicating the suitability of the representation for the specific design stage)
to the block models. Some confusion is expected if the building volumes are not proportionally correct.

**LOD2 (detailed roof)**
LOD2 is much more appreciated compared to block models. Evidently, roof information assists in understanding the design. The surveyed population (60%) accepted the use of LOD2 (without texture) in the urban plan. The texture, that provides more information on facades, was viewed as dangerous at this stage. Our interview revealed an interesting observation, i.e., the level of visual detail is understood by the actors as having a relationship with the stage of the project. Abstract forms and hand drawings are tools for the beginning of the project. More details and computer-generated lines depict a finished design. The style of drawing may have an implicit message, which is not necessarily interpreted by professional and non-professional actors in the same way. Therefore, the participants were recalcitrant towards the possibility of using the LOD2 for the master plan (23%), but approved the utilisation of LOD2 (57%) for the specialisation plan. LOD2 models are becoming attractive for the architectural plans (57%), which is not surprising given the combination of textured and realistic images.

**LOD 3 (architectural envelope)**
LOD 3 was indicated as the necessary abstraction for presenting and discussing the architectural plan (70%). This is the stage when all of the final details are combined and the design ideas should be presented in high quality. This is the only phase that a high level of realistic visualisation is required. Despite the consideration of such visualisation for other phases, the benefit was not apparent during discussions.

The group of experts warned that 3D representations may also be confusing if the viewpoint is not that of the inhabitant walking on the street. For instance, the view of an observer from a building above may be ideal for a marketing aim, but most inhabitants will not be able to draw conclusions regarding the street-level experience. Combining 3D models (or reference images) with realistic elements of the present situation appears to significantly assist in understanding the design. The expert group did agree that interaction (see below) would also play an important role. For example, a computer animation with an existing tram integrated into the design allowed for a greater comprehension by non-professional actors (Poptahof).

**LOD4 (indoor)**
LOD4 was only appropriate for the last phase of design (architectural plan), although some of the urban designers did not consider this abstraction important for urban renewal (as discussed with the experts). Building interiors may be designed for public buildings, such as shops, cinemas, and restaurants, but this is rarely performed for individual houses. The perception of floor plans by citizens is generally better if room dimensions are given. However, this opinion can easily be altered by the availability of more 3D indoor models. No models investigated in this study had designed indoor space, and therefore, further studies are necessary to derive a strong conclusion.

### RESULTS ON INTERACTION

The questionnaire participants assumed that a visual environment was available for all actors during the renewal process and had to define the appropriate functionality for different actors. The different phases of renewal were not the focus of this study because every phase may require animation, navigation, query, sending feedback, or revision. For simplicity, the users were clustered into three groups: housing agencies, municipalities, and fic-

<table>
<thead>
<tr>
<th></th>
<th>Housing Agencies</th>
<th>Municipalities</th>
<th>Municipalities for Citizens</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Animation</strong></td>
<td>100</td>
<td>87</td>
<td>75</td>
</tr>
<tr>
<td><strong>Navigation</strong></td>
<td>83</td>
<td>95</td>
<td>83</td>
</tr>
<tr>
<td><strong>Query/Exploration</strong></td>
<td>66</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td><strong>Feedback</strong></td>
<td>50</td>
<td>66</td>
<td>75</td>
</tr>
<tr>
<td><strong>Editing</strong></td>
<td>66</td>
<td>79</td>
<td>25</td>
</tr>
</tbody>
</table>

*Table 2. Results on interaction (in % of participants indicating that the interaction should be present)*
tive ‘citizens’. As discussed with the group of experts, the citizens were not approached directly because variation in their opinion is relatively high. Instead, the municipality provided information (based on experience with citizens) on the functionality type that would be appropriate for citizens.

**Animation**

Animation was one of the most well accepted tools (75-100%) for presenting a particular design to a group of people. The expected quality of animation increases with more advanced phases. The experts group confirmed that animations are the best tools for presenting projects to citizens. Video recordings are performed mostly during the beginning of the renewal project to demonstrate the existing design problems. An interesting result was that the system should be able to animate and simulate a scenario. Animations have been developed to illustrate the development of green areas, traffic, sun movement (to be able to estimate the shadowing), noise distribution, and many other characteristics. Animations may also be 2D, e.g., to illustrate the growth of a city in the last five years. The animations created for our study were in the walking-through and flying-over categories created for and presented in Google Earth (see Figure 3).

**Navigation**

All the participants agreed the desktop navigation possibilities of walk-through, fly-over, and examine should be available. Most of these options worked with visualisation environments, such as Google Earth or Virtual Reality browsers. This level of interaction was classified as compulsory for all actors when 3D digital models were utilised. Almost all of the surveyed population agreed that the system should have multiple linked windows to visualise co-coordinated views of different data and dimensionality (83-95%). If necessary, the user should be able to turn off the coordinated windows and view only the 3D scene and/or the 2D map/plan.

As the urban renewal involves comparing existing and new situations, the study participants agreed that the system should be able to visualise existing situations and designs in different representation for specialists. The municipalities also viewed the navigation as more critical for the specialists than for the citizens and disagreed with the sharing of information with citizens at all phases. Urban planners in Delft, Den Haag, and Rotterdam thought that there was no benefit to consulting citizens during every phase.

**Query/Exploration**

The two groups, i.e., municipality and housing agencies, considered a model query as a necessary property, which allows users to ‘click/query’ objects. Evidently, this option is more important for the municipalities (79%). The discussions during the workshop revealed that while further questioning and information request is important, direct user manipulation of the 3D scene is not vital.

The participants agreed that the system should have a dynamic spatial query to determine such values as streets, specific areas, and locations by a given postcode, similar to Google Earth (66-79%). This was classified as a functionality that was absolutely necessary. The same is valid for the elaboration of 3D models through hyperlinks and linked windows. The general conclusion is that municipalities are prepared to provide a large set of exploration possibilities to both specialists and citizens.

**Feedback**

Feedback is considered important when specialists discuss and present designs to citizens, but real-time discussions or the collection of opinions and off-line analysis is preferred. Computerised feedback for citizens was viewed as beneficial by 75% of the interviewed specialists. Many officials at the municipalities and housing agencies regarded tools, such as interactive chatting, as low priority.

Although certain tools, such as interactive chatting and videoconferencing, increase collabo-
ration and design interaction, this option is still not accepted. The specialists indicated various reasons, which included that 'chatting is relatively slow' (better to talk via phone), 'videoconferencing might be unreliable' (better to discuss face-to-face), or the high quality video-conferencing system is expensive. However, nearly all participants agreed that the system should have functionalities for email feedback or electronic voting (absolutely necessary).

Editing
The editing of provided information could be permitted only for specialists (66-79%). However, 75% of the municipality population disagreed with allowing citizens to move and delete 2D/3D objects and their attributes. Agreement was reached on the system having functionalities to locally modify views, colours, and transparency, without changing the municipality database.

Interesting results were obtained on the editing of information by specialists (see Kibria 2008 for more details). While the majority of municipality participants were interested in allowing housing companies (53%) to add 3D models to the system (assuming that the system is managed by the municipalities), only a minority (33%) of the housing agencies were interested in sharing 3D data with the municipality. These agencies preferred to provide their data via services. In both cases, the municipality (67%) and the housing agencies (83%) strongly disagreed on whether such data should be copied and saved. Both groups demanded to have the functionality to hide and filter information (80%).

In general, housing agencies and the municipality did not differ much in overall opinions regarding required functionality. The system should be more elaborate for design specialist, and provide basic navigation and exploration tools for the citizens. Data sharing is a very sensitive issue for design-professionals who do not want to share the entirety of their design models with the municipality. However, these individuals understood the benefits of comparing and sharing.

OUTLOOK
In this paper, we reported our investigation on the use of 3D models and interaction tools for the urban renewal design process in the Netherlands. The presented case studies, interviews, questionnaires, and discussions confirmed the assumption that computer-generated models could be a flexible solution to avoid misinterpretations during the urban renewal process. After learning the provided taxonomy and tools, the participants posed many questions regarding system architecture for model organisation. Such architecture (outside of the scope of this paper) can be designed on the basis of GIS, CAD, DBMS, and VR software packages. The 3D models (existing and design) can be organised in a DBMS system that could be accessed by GIS, CAD, or VR software depending on the users and tasks to be performed.

The concept of LOD (not know by the participants) was evaluated as a very promising approach to agree on abstractions and representations during the different renewal phases. Consensus was reached among the participants that the best abstraction was a map representation for the master plan, LOD2 (non-textured) for the Urban plan and Specialisation Urban plan, and LOD3 (with photo-realistic textures) and LOD4 (for public buildings) for the Architectural-quality plan. LOD1 might be of interest when reviewing non-important existing situations or for analysis (mobile coverage, sun-shadow analysis, and wind analysis). The discussions did not reveal a lack of digital possibilities for visualisation, but often included that the proposed alternatives should be simultaneously visualised.

Our investigation revealed that the tested levels of interactivity could be utilised for the presentation and communication of project alternatives. The municipalities were convinced that the citizens should not extend beyond providing a feedback, which is a feature of most public participation systems. Animations, navigations, and possibilities to explore the design proposal via additional information from web links are the best tools. The municipalities were allowed to consider higher functional and interaction possibilities for design specialists. However, a system that can manipulate all of the data to allow multi-view visualisations and even editing may be beneficial. Several of the municipalities have begun using types of investigation systems, such as GIS, CAD, DBMS, and other Virtual Environments, that are able to provide this functionality.
ACKNOWLEDGEMENTS

The authors express their gratitude to the Programme Sustainable Urban Areas (SUA) of the Delft University of Technology for making this research possible.

REFERENCES


DE BRUIJN, J, TEN HEUVELHOF E. 2000, Networks and Decision-making, Lemma, Utrecht


EIJK, P. 2002, Changing water management in urban renewal in the Netherlands; ecological modernization through a participative strategy, in: Global Solution for Urban Drainage, Conf. 8 13 2002, Portland USA


ISIKDAG, U. 2006, Towards the implementation of Building Information Models in Geospatial Context, PhD Thesis, University of Salford, UK


LUCK, R. 2007, Using Artefacts to Mediate Understanding in Design Conversations, Building Research & Information, 35(1) 28-41


SNEIDERMAN, B. 1998, Designing the User Interface: Strategies for Effective Human-computer Interaction, Reading MA., Addison Wesley Longman, Inc.


Authors' Addresses:
Sisi Zlatanova
Delft University of Technology, OTB Research Institute for Built Environment , Department GIS Technology, Jaffalaan 9 2628 BX Delft, S.Zlatanova@tudelft.nl

Laure Itard
Delft University of Technology, OTB Research Institute for Built Environment , Department Sustainable Housing Management and Quality Assurance, Jaffalaan 9 2628 BX Delft, L.C.M.Itard@tudelft.nl

Mahmud Shahrear Kibria
ESRI, Weena 695 (B2 - 036), 3013 AM, Rotterdam, mkibria@esri.nl

Machiel van Dorst
Delft University of Technology, Faculty of Architecture, Department Environmental Design Julianalaan 134, 2628 BL, Delft, M.J.vanDorst@tudelft.nl
THE 'CLOSED/OPEN' DUALITY IN CONTEMPORARY URBAN FORM

Melinda Benko

Abstract
One of the innumerable ways to systemise contemporary European urban projects is to analyse the urban form originates from the master-plan concept. The duality of closed and open urban situations is an excellent conceptual tool for classification. This classification helps us to recognise, understand and represent the diversity of the city, as it is present on each level of a settlement and architecture.

In the case of "Solid-oriented" projects construction and emplacement of buildings are the main goals. The principle of "Solid-oriented" projects are based on two very different, still existing traditions: One is the classical European closed block structure, while the other one is the Modernist open urban system. Today we can identify two new approaches combining those two traditions in different ways. Urban transparency preserves streets, the effect of enclosure, and the dominance of buildings. At the same time density is coupled with spaciousness, blocks are fractured and the environment becomes more complex even within one block. The in-between method, based on the idea of structuralism, attempts to balance the importance of mass and space and creates permeable blocks in a new open urban structure. Besides creating urban volumes or buildings in the city, there is a new type of challenge in contemporary urban design. Since the 1990's attention has shifted to cityscape, i.e. to re-interpreting and reforming open spaces. The international literature calls this un-volumetric architecture. The duality of openness and closedness also appears here. While openness seems to dominate urban situations in contemporary cities, buildings are predominantly used in a closed manner.

Keywords: Urban Design Theory, Closed Blocks, Transparency, In-Between, Openness.

INTRODUCTION

These days major urban developments tend to concentrate on either transforming historically non-urban areas, or on interpreting pre-existing urban situations (such as former industrial sites) in the light of current social and economic demands. In these processes, the aspects of urbanism, town planning, urban design and architecture will necessarily become interconnected. From the multiple perspectives from which these transformations of European towns and cities could be analysed, this study focuses on the physical imprints left on urban form by the information society.

space and mass
Studying the relationship between space and mass is not only a core topic in building-oriented architectural history, and -theory, but it also provides an excellent tool to understand the changing urban landscape as well. The widespread solid / void morphology was flourishing in the second half of the 20th century. It relied on three main sources. First, Nolli’s map of Rome was an early precursor of this morphology. Then the French and German topographical methods and results of geographical researches influenced it. And finally, it built on the Gestalt psychology developed in the first half of the 20th century.

Gian Battista Nolli’s map of Rome (1748) was created with the intent of representing spatial relationships predominant in public use. Only those building parts and inner spaces which are physically and/or visually closed for the public are indicated as solid masses. Therefore the continuity of external urban space is not necessarily interrupted by each building, and the ‘open space’ quality of streets and squares is enhanced by the interaction with the internal spaces accessible to the public, such as public enclosures of churches, palaces. The map shows the ground level plans of public buildings, including the lateral space boundaries. These
boundaries separate and at the same time interconnect the external and internal spaces. Large internal courtyards and gardens (indicated as white voids) make the map of Rome loose, creating a graphical balance between white and black associating them with solid and void. In the city thus depicted, new ratios of mass and space appear, relationships between inner and outer spaces are revealed, and the places of human activity and patterns of space usage are displayed. In contemporary urban design, the frequently used representation of ground floor layouts and external spaces with the same level of details also originates from this idea.

In the early 20th century a new topographical procedure was elaborated by French geographers. This procedure allows the relationships to be revealed among existing natural forms and features and the objects built into the landscape. By splitting up the environment into layers, it provides easily separable pieces of information, each of which can be independently presented, interpreted and analysed. Those layers are highlighted which are the most important ones from the perspective of urban landscape, such as the road network, the distribution of plots and built objects. Each of the presentations can be read on its own, but when superimposed they can also provide significant information about the city by unveiling additional contexts. The procedure can be applied in any research of urban forms. This makes it more and more popular in urban design, and it leads to the development of abstract space/mass and solid/void presentations, which are easy to interpret and evaluate. Today’s computerised world evolves by means of layers, and thus reality can be broken down into more and more, easy-to-superimpose layers. Elementarism in urban analysis and design (Vigano 1999) has already expanded the limits of opportunities hidden in that procedure by splitting up the city into redefined physical components and then combining them in new ways, to provide new knowledge and information that can be used in planning and design work.

Also in the early 20th century, Gestalt psychologists in Germany became interested in understanding the perception of objects and forms. They introduced the category pair ‘figure’ and ‘background’, which has remarkably influenced the urban design, architectural analyses and theories. The role of space and mass came to be known to complement and mutually presume each other in a given context, and those analyses are placed in the forefront, which are reflecting on the historical changes of solid/void and mass/space dualities that are shaping the urban fabric.

**solid / void morphology**

The solid/void morphology was developed in the second half of the 20th century. Black/white, solid/void and mass/space diagrams give a clear sense of structure of the city according to site location, social context and historical changes. In that way fundamental differences between a traditional historical city and a modernist city are visible in terms of urban design and architecture. Analyses of that morphology made by Italian, Swiss, French and Belgian schools primarily provide a well-established theoretical foundation for the rehabilitation of historical city centres, promote the re-discovery of urban values and contribute to the criticism of the object-centred culture of modern architecture. The form of a city is summarised in the architecture of that city (Rossi 1966). An influential group of Italian architects in the 60’s (e.g. Aldo Rossi, Carlo Aymonino) studied the correlations between the form of the city and the typology of buildings in the centre. In such a way civic design morphology comes closer to architectural typology, and the relationship between city and architecture becomes an important part of both theory and practice. The American Colin Rowe developed his own method of black/white, solid/void representations. He was building on his research during his studies in Rome, on Nolli’s map, and on the principles of configurationism. He became widely known due to his work with Fred Koetter: The Collage City, (1978), where his illustrations reveal and visualise the differences between the traditional and the modernist city, contributing to the fulfilment of post-modern architectural theory and practice.

From the point of view of how European city evolution treats space and mass, and their relationship, Christian de Portzamparc (Portzamparc 1995) defines three types. A classical historical city is a massive condensation in natural space, and in the solid/void graphics of the city is dominated by the mass. The boundaries of modernist city break up after the industrial revolution, and the settlement occupies a larger and larger territory in the landscape. It loses its massiveness and becomes a borderless ‘urban landscape’. The solid / void repre-
"It is further suggested that neither object nor space fixation are, in themselves, any longer representative of valuable attitudes. The one may, indeed, characterize the ‘new’ city and the other the old; but, if these are situations which must be transcended rather than emulated, the situation to be hoped for should be recognized as one in which both buildings and spaces exist in an equality of sustained debate."

(Rowe and Koetter 1978 :83)

sentation of the city is the opposite of a traditional city, as the modernist city becomes a continuous space where built masses appear in separation as stand-alone items. Contemporary cities continue to carry that dual history as traditional and modernist cities are both parts of their history. Homogeneity and the desire for homogeneity cease to exist, people today accept and explore the new opportunities hidden in the heterogeneity. Attributably also to its size, a city is a ‘patchwork’ metropolis built of juxtaposed and superimposed fractions, a fragmented chaos.

CLOSED / OPEN URBAN SYSTEMS

Mass and space, appearing as solid and void in the physical structure of the city, is perceived in life as closed or open. This closedness / openness is a phenomenal quality of the urban form, where space use and space experience comes to the forefront. In analysing this closed and open quality, we make use of the basic unit of the city, the block. Traditional urban blocks underwent extreme changes in the 20th century: nearly all the interim stages appeared, from units fully enclosed by continuous boundary walls, to the entirely open units. On the range between the two extremes of closed and open urban forms, the development concepts of contemporary urban design are split up into four typically different groups: closed, transparent, in-between and open city fabric (Benko and Fonyodi 2009).

The most common and versatile pattern of traditional European city culture is the network of streets which includes recurrent series of blocks generally closed by continuous boundary walls. The closed effect on the street front can be achieved by various coverage pattern types and densities. In extreme case, the built-in area of the block can be 100%. Generally city blocks with closed boundary walls are divided into subplots, where each subplot is fully or partially built in on its boundary line. Such urban forms include the single storey patio houses in ancient Greece, the multi-storey leasehold blocks in Roman cities, the urban palaces in the Renaissance, and the blocks of leasehold flats accessed from an external corridor around the courtyard in the middle in Budapest. In the 20th century a new building regulation begins to spread, requiring back-to-back inner courts to be intercon-
nected. While in smaller towns it had already been the practice, this typology, the "joint yard pattern", became typical between the two World Wars in major European cities (e.g. Ujlipotvaros, Budapest).

As the last step of the enclosed traditional block transformation, the blocks with 'framed coverage' can be mentioned. Here the block acts as a single plot that is built in all along its external perimeters (Panerai and Castex and Depaul 1997).

As an effect of the 20th century's modern principles of urban design, closed urban blocks break up, and for a long period of time, the above mentioned urban form is rarely used. Post-modern theories and the contextualist approach, however, rehabilitated the typology, which as a result still survives in today's urban design. Its major values are creating an intense urban character, preserving the significance of streetscape, and clearly distinguishing external public areas and internal open spaces.

The contradiction between the increasing extent of investment projects, often buildings occupying the entire block, and the historical city which was intended to be invoked or just happens to be surrounding it, raises a number of questions. Various urban design solutions attempt to answer those questions. The traditional system where blocks divided into subplots are built plot-by-plot, as gaps still exists. There the freedom of massing is heavily limited by the size of the plot and the requirements relevant to the plot, which usually results in the contemporary application of historical patterns (e.g. Chiado rehabilitation, Lisbon - urban design by Alvaro Siza). It is frequent today that a block is treated as one plot. Unfortunately, when it comes to a development that can actually be regarded as a single building or urban block, often a single architectural practice prepares all the
designs for the sake of easier implementation. Thus enormous, whole block-size units are shaped with unified architectural appearance, far exceeding the scale of traditional urban residential buildings (e.g. Corvin Promenade, Budapest - urban design by Gyorgy Alfoldi). In other cases, the master plan is designed to imitate the plot-by-plot coverage pattern, or it uses collage-type composition made of ‘invocations’ (e.g. Schützenstrasse, Berlin - urban design by Aldo Rossi). But the desired urban diversity can also evolve if more than one architects design the block. In such a case, different architects design the buildings on the basis of the master plan concept. Thus, today’s equivalent of a European historical city’s closed block comes into existence under the supervision of a single investment project, preventing problems such as monotony or losing the right scale (e.g. Sluseholmen, Copenhagen - urban design by Sjoerd Soeters and Arkitema).

In architectural context, transparency has multiple meanings. The word was included in the important concepts of architectural and design theory, due to a study written in 1955 by Colin Rowe and Robert Slutzky (Rowe and Slutzky 1992). The authors made a distinction between physical transparency, (i.e. the transparent attribute of materials) and the so-called ‘virtual transparency’, i.e. the intersection of surfaces, layers and spaces that results a new quality. The interpenetration of spaces is an ancient architectural tool to define space consciously and instinctively, while transparency as physical property, reformed architecture when certain materials, such as glass and metal, became widely used in the 19th century. The break-up of traditional closed blocks, where block contours remained but the inside of the block became visible, could be seen as the most important step to provide transparency in urban context. International literature uses the term ‘transparent block’ with multiple meanings since the late 1980’s. On one hand it refers to the new urban typology made by the combination of traditional closed blocks and modernist open blocks. On the other hand it describes the block typology which has physically closed boundaries, but the block is visually transparent, and/or access is permitted by opening up the boundary walls.

A transparent block creates an intensive, livable urban character, and offers diverse development pattern opportunities and multiple potential architectural appearances. It enables adaptation to the local context, the incorporation of existing elements, and the functional, architectural, altitudinal,
etc. articulation of the block. In terms of space perception and space use it results in transitional situations: the city's genuine spatial articulation remains intact, while the desired separation between open spaces outside and inside the blocks stays clear.

Historically, there is a typology of closed blocks with gaps in between, where the boundary between public and private spaces can be clearly identified, but the bordering mass is not continuous, allowing occasional views inside the block. Like a rhythmic series of columns which can have the effect of closed wall or open space according to the viewpoint, the wall with in-between gaps is a definite 'boundary wall generator'. As such it carries the possibilities of both openness and closedness simultaneously. This urban typology also allows for stand-alone, sculptural building mass. Thus, while the sensation of the street is retained, the articulation of the city is more diverse (e.g. ZAC Masséna, Paris - urban design by Christian de Portzamparc).

Vertical articulation is also a frequent tool: the building on the ground level or on the levels below is a single volume. Above these levels the building mass is articulated with boundary walls interrupted by gaps. In this way, the ground level zones are interacting with each other, the street constitutes a traditional closed boundary wall, while the building mass above becomes lighter, creating a sensation of openness. Transparent mass can be created by building elements (balconies, balustrades, roofs, etc.) creating coherence among separate masses built along the same plane, giving them the character of a street (e.g. ZAC Bercy, Paris - urban design by Jean-Pierre Buffi).

An international research group, primarily Dutch and Spanish architects, set out the principles of the turn-of-the-millenium architecture in quest for new directions, in their book The Metapolis Dictionary of Advanced Architecture (Metapolis 2003). In this they analysed the phenomena of contemporary cities and architecture in the light of the current techniques, trends, economic and social context. This type of "advanced architecture" is the product of globalisation and it is connected to the present digitised society. The "advanced architecture" constitutes a 'non-closed', unfinished, 'non-determined' system, open in its spirit. It does not impose limits but strives to multiply possibilities. It believes in complexity, treats heterogeneous abilities in the existing environment as a field of endless possibilities; continuously looks for information, collects and re-uses it. Its essence includes novelty, the constant change, motion and continuous exchange of information. In their dictionary they define the "city" as "an old term that has not been analysed for its obsolescence". The use of cityscape or urban landscape is placed to the forefront instead. Landscape is a very broad, collective concept here: it includes the environment, developments, human actions and events themselves. Landscape takes shape by way of intersections; it is neither unified, nor unique or closed, but a realm of various overlapping layers. It is necessarily limitless, heterogeneous and dynamic. The use of the concept 'landscape', which urban design and architectural theory has placed to the forefront in the 90's, corresponds to the demand for limitlessness as in post-modern science; and the necessary attachment of the urban landscape to the nature, instead of the 'sinful' modern city, tells the promise of innocence for the new generations. As part of this approach, the concept of 'in-between' emerges, both in theory and practice, as a new solution in urban design, getting rid of the past, and thereby discarding both traditional closed and modernist open blocks as well as transparent urban forms that strive to unify the values of those two approaches.

This approach, like any other novelty, is not without antecedents. The Dutch structuralism appeared in the 60's as the criticism of modern urban design. It recognised the necessarily chaotic nature of cities and kept on searching for positive
forces inherent in the chaos. It advocated for arranging brave forms into dense fabrics and creating intelligibly articulated locations (Van Eyck 1962), instead of historical closed blocks or oversized modernist objects in empty space. Instead of the conflict of closedness and openness, it uses the 'in-between', the logic of 'either/or'. Mediated by contemporary Dutch urban design theory, these dormant ideas found their way to the surface in the 90’s, re-discovering landscape as a medium to create connections. The first urban design projects based on these principles were completed. At the same time, the society's changing expectations towards urban design and the digital technologies reforming architecture and urban design also call for new, sculpture-like forms that are about to find their places in the city.

Often a development area itself behaves like an island, an enclosure in its surroundings. Movements and inner road networks determine the block's inner structure, thus designating the locations to be built in within the block. The external boundaries of the area may be entirely closed, built in; thus the group of buildings, living in its own world, can be felt to turn inside, which strengthens the use of the internal open space, the accessible landscape. Another frequent articulation type is where the exact block contour exists only virtually, and the elements of the development touch that perceptible, but invisible boundary in different ways. The application of this development type is more and more common in city rehabilitation schemes because, by being heterogeneous, it is very receptive, and old, existing buildings and squares can easily be made part of this typology (e.g. Amerika Plads, Copenhagen - urban design by West 8). In the long run, it may also be capable of incorporating the currently unknown, yet to be built elements in the area. It is an open system.

In design based on the 'in-between' principle, the built elements of the implemented urbanised landscape are as important as the in-between spaces to create cohesion between those elements. The free, open space among mass islands in the city can be controlled by design. Thus the chaos is confined, the buildings with different character and function do not communicate with each other, the 'space' among them helps to keep distance. At the same time, a block is accessible to everyone, and thus the spatial system in the city is enriched by the open spaces inside blocks, and the area becomes open.
woven into an existing network (e.g. De Brink Centre, Hengelo - urban design by Wilson and Bolles). The designed landscape gives the sense of continuity of contemporary order where fragmentation, freedom, spontaneity, closedness and openness can assert themselves.

Illustrations analysing solid / void urban forms clearly demonstrate the differences between historical and modernist cities: space outweighs constructed masses and the domination of closedness. The block boundaries do not prevail in the scene anymore, the coherent web of the city is broken up, the building masses are incorporated in blocks, the urban culture of 'openness' takes over. The public spaces outside the blocks are flowing in and through the blocks. The open block shows a rather diverse configuration, as neither the walls of built elements, nor the area of the space use are overlapping the actual block boundaries.

The weakening and subsequent cessation of the closedness of urban blocks can be related to different issues of urban design. The opening up of urban blocks was partly enabled by the changes in land ownership. Historical urban blocks were generally divided into subplots, which, with their high density, were not suitable for today's living standards..Block-sized plots appeared in the early 20th century, for which potential development typologies show a much wider diversity. This happened for example in the case of the development of South Amsterdam in 1915, where housing associations were established to build housing estates, in order to avoid the splitting up of blocks into subplots. The deconstruction of the block took place step by step in the areas (primarily in Germany, Switzerland and Holland) influenced by the functionalist and anti-monumentalist ideas of new objectivity.

On the other hand, Le Corbusier's design of the 'metropolis for 3 million people' presented in Paris in 1922, laid the theoretical foundations of a radically new urban design. It disowned the city of the past, and replaced the former design principles by something brand new: closedness and multiplicity was replaced by openness and standardisation. Buildings are stand-alone masses in continuous space. The increased height of buildings based on the latest construction technology enables the required density to be reached. Buildings are sculpturally formed solitary objects. The urban typology is composed with the intent to appear with abstract picturesqueness. The city is split up into functional zones. It is only the natural features of the location that come into consideration (site location, water, vegetation). There are no traditional urban contexts any more: there are no streets or blocks, no public or private areas, nor building locations (corner building, vis-à-vis or neighbouring buildings) in the traditional sense. An old desire of social and architectural utopias came true (u-topos - 'placelessness') when architectural creation was liberated, and became independent from its environment. Today's stand-alone, large-scale buildings are placed inside open blocks, seceded from the fabric of the city (e.g. Diagonal Mar, Barcelona - urban design by Robert A. M. Stren).

The American-type, motorisation-based evolution of cities and the social and economic demands requiring such evolution all favour the development of borderless structures extending over the landscape. The de-urbanisation that start-
ed in Europe in the 60’s, accelerated the spreading of this openness-based urban typology. Residential communities, industrial parks and logistical areas are spreading Europe-wise, but diverging from the initial principle of complete openness: plots are closed for security reasons (e.g. Graphisoft Park, Budapest - urban design by Cságoly Ferenc and Nagy Béla). Openness continues to prevail in the scenery while closedness and control characterises the use of buildings.

CONCLUSION

While openness seems to prevail in contemporary cities, in reality buildings are predominantly used in a closed manner. Both the European historical cities’ traditional closed block and also the transparent block, which loosens up the city’s fabric, remain in use simultaneously. The architectural culture of stand-alone buildings in the modern city is predominant, but in urban sense, it contradicts the principles of the 20th century. Urban blocks in the contemporary city fabric are visually open but physically completely closed instead of being freely accessible streams of space. But the ‘in-between’ typology strives for new paths of urban design corresponding to today’s social forms: they expand the system of the city’s network, make blocks accessible, and balance on the boundary between the individual and the community, the closed and open use of the city.

REFERENCES

BENKO, M. AND FONYODI, M. 2009, Glocal city – kortars europai varosepiteszet, Terc Kiado, Budapest, Hungary


PANERAI, P. AND CASTEX, J. AND DEPAULE, JC. 1997, Formes urbaines – de l’ilot à la barre, Éditions Parantheses, Marseille, France


ROSSI, A. 1966, L’architettura della citta, Marsilio, Padova, Italy


Author’s Address:
Melinda Benko
Department of Urban Planning and Design,
Faculty of Architecture
Budapest University of Technology and Economics
benko.melinda@gmail.com
Iftekhar Ahmed, Jalel Sager & Le Vu Cuong

Abstract
This paper presents concepts important for understanding the potential of sustainable low-income housing in Vietnam, with a focus on key environmental, socio-economic, and cultural dimensions that bear on its housing sector. It examines challenges for sustainable urban development in Hanoi and HCMC, Vietnam’s two main cities. Recognising the current challenges in balancing affordability and sustainability, the study explores Vietnam’s lack of adequate and affordable housing and the problem of its urban slums. Synergistic strategies suitable for the Vietnamese context are then suggested for sustainable low-income housing in these two cities.

Keywords: Vietnam; Low-Income Housing; Sustainability; Neoliberal Urbanism.

INTRODUCTION

Housing for the poor in developing countries has been a focus of international development for at least half a century, while the more recent concern for sustainability has brought a new set of issues into consideration. Sustainable housing must simultaneously ensure a reasonable quality of life (health, comfort and climatic adaptation) and minimise energy and water use, and waste (Tuohy 2004). Thus it must take into account environmental, cultural, technological and socio-economic factors, a concept broadly diffused through the literature and at international conferences such as HABITAT II (Ebsen and Rambol 2000). Sustainability for low-income groups in particular must aim directly at the economic dimension (Karuppannan and Siva 2009), though truly ‘green’ affordable housing should integrate all the components of sustainability (Landman 2007). This challenge has become complex due to trends over the past decades toward privatised urban development (Graham and Marvin 2001) and rapid slum development (Davis 2004). The availability of public resources devoted to securing sustainable low-income housing is a crucial question, which will partially determine whether the poor in Vietnam’s major cities would be assimilated into economic mobility or locked into marginality.

As several sources suggest, social equity should be based on economic and environmental sustainability (Cook 2007; Kennedy 2004; Kendall and Teicher 2000; Sassi 2006; Williamson 2003). These authors all point to the interconnected and interdependent nature of sustainability components, revealing the multidimensional nature of the challenge. There are linkages across scales as well - sustainable housing is an essential component of sustainable urban, regional, and national development (Huong 2003). Therefore a holistic and interdisciplinary approach must be taken in the planning for sustainable low-income housing - a change from former practices in which one-dimensional economic analyses dominated, in many cases a practice of false economy. Balancing the trade-offs between sustainability and affordability should help reveal and mitigate hidden social and environmental costs in substandard low-income housing (Nguyen 2009).

ECONOMIC REFORM AND LOW-INCOME HOUSING IN VIETNAM

Since introduction in 1986 of the market liberalisation and economic reform policy, “Doi Moi”, in line with neoliberal dictum, social transformation has led to the state’s retreat from its former controlling functions in the field of urban development. In moving from a centrally planned subsidy economy to decentralisation and a market economy, Vietnam has experienced rapid urbanisation due to economic growth and structural change, especially in Hanoi and Ho Chi Minh City (HCMC). While some
sectors of society have reaped benefits, the living conditions of millions of low-income public sector employees have declined because of economic restructuring, cuts in social services, and the privatisation of public enterprises (Lachance 1997). Urbanisation has occurred too quickly to control - cities became overloaded, presenting their poor with housing, environmental and livelihood difficulties as well as limited access to social services. While post-Doi Moi poverty reduction policies were often designed to target rural areas that supposedly held more than 90% of the low-income population, urban poverty remained a largely unaddressed issue (Hanoi UAC 2004). The proportion of the urban poor nonetheless reduced significantly after economic liberalisation due to concentration of wealth in cities; this group can be differentiated from the 'low-income' group - defined here as those who can meet their basic minimum needs, but are unable to afford housing in the formal sector. In this study 'low-income housing' is considered in the context of both groups.

Housing demand is very high in major cities, but the majority of people do not have enough income for it, as the cost of land is very high in relation to average income - such development corresponds with the theory of neoliberal urbanism put forth by Neil Smith (2002) and others, an expanding global paradigm and a gentrifying logic that propels the poor to the margins of urban existence worldwide, reproducing widening economic disparities in spatial distribution. A large number of low- and medium-income individuals have no access to the formal real estate market and must seek informal affordable housing solutions, however inadequate. Thus the increasing rich-poor gap is reflected in the housing market (Vietnam News 2007a) and the quality of housing.

From mid-1970s to mid-1980s, urban mass-housing was subsidised by the government despite this being an era of economic difficulty (Evertsz 2000; Geertman 2007). Doi Moi was a transition from market-oriented socialism to a market-oriented economy that brought participation of private enterprises in most economic sectors and sharp reduction of state housing budget. The level of state support plummeted, ranging about 4-10% during 1995-1998 (Hanoi Statistical Office 1998), leading to rapid growth of private housing construction. Tables 1 and 2 show the main housing providers and actors at the end of the previous decade, indicating the significant role of self-help construction that characterises the sector. HCMC being an economic hub has experienced more investment by private sector developers than Hanoi, but clearly, the shrunken state role and expansion of the private sector is indicated with 60-70% self-built housing in Hanoi and HCMC (JBIC 1999). Infrastructure and public housing have not kept pace with the rapid urbanisation process. Most public housing is in bad condition and needs renovation, and rural-urban migrants living in slum areas and informal housing "woven" into the decaying urban fabric pose large challenges for upgrading (Gattani 2003; Geertman 2007; Ha 2002). Low-income groups are scattered throughout the cities. In Hanoi, although there are large concentrations of the urban poor in central areas, more poor people now live in suburban areas than the inner city, a result of relocation and gentrification.

<table>
<thead>
<tr>
<th>Developers (30%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State (27%)</td>
</tr>
<tr>
<td>Private (3%)</td>
</tr>
</tbody>
</table>

Table 1. Housing development in Hanoi (adapted from JBIC 1999)

<table>
<thead>
<tr>
<th>Involvement of Public Sector (20%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Sector (80%)</td>
</tr>
<tr>
<td>Investors (20%)</td>
</tr>
<tr>
<td>Residents (60%)</td>
</tr>
</tbody>
</table>

Table 2. Housing development in HCMC (adapted from JBIC 1999)

1 Vietnam’s cut-off income level for poverty is VND 6 million (about $315) per year (Hanoi UAC 2004), which cannot support basic needs adequately.
Hanoi’s older areas also contain many slums and areas of unplanned construction (Ha 2002), though informal housing is not pictured on maps and thus difficult to locate precisely.

Housing can be divided into two main categories - formal and informal. Formal housing is legal, produced through the interaction of several parties: the state, state-supported companies, business companies and communities. Informal housing is more complex and has different forms - illegal, squatter, irregular or slums. This category emerged in the midst of rapid urbanisation and consequent growth of the informal sector. Informal housing settlements, particularly squatters, are transitional areas, though the houses built may be substantial. They are often located on the fringe of cities, riversides, waste dumps or under bridges - with little or no infrastructure. In terms of construction, housing can be categorised as permanent, semi-permanent, temporary or simple (IPUMS 2000). Formal housing is permanent, while informal housing can belong to any of the categories - a surprising amount of informal housing in Vietnam is ‘permanent’.

Urban planning for main cities is conducted through a top-down centralised process at three levels: a regional zoning plan, an urban development zoning plan, and a detailed area plan, with housing managed under the last (Geertman 2007). The national government manages the first two levels and has assigned the third to local authorities (Vietnam News 2007a), yet lack of capacity and corruption are endemic at the local level, explaining many difficulties in housing management and flourishing of illegal construction. In recent years perhaps 80% of housing in Hanoi and 40% in HCMC have been constructed without legal permits (Ahmed 2009). The government’s master plans for urban development are not sufficiently detailed and informal housing areas are not recognised (Geertman 2007; JBIC 1999). Lacking information, the government finds it hard to manage individual houses and areas, while the planning and growth of illegal housing proceeds apace.

Meanwhile rapidly increasing urban housing demand leads to high density, overloading infrastructure and service systems. City administrations have not been able to maintain the basic infrastructure (Gattoni 2003; Jemal et al 2006; Phan 2008) and most public services, such as schools and hospitals, and electricity, water supply and drainage infrastructure have become overwhelmed (Jemal et al 2006; Phan 2008), fitting the wider pattern of degraded public spheres and services typical of neoliberal urbanism, as observed for example by Klein (2007). This trend is visible mainly in three types of urban areas:

- **Social housing constructed before 1990:** Most pre-Doi Moi housing was subsidised by the government and has degraded seriously. The uncontrolled retrofitting, building extensions and poor infrastructure have serious environmental and social impacts (Vu 2008; RMIT and VGBC 2009).
- **Old city quarters:** Extended, multi-generational families increase the infrastructure burden in these areas (Phan 2008; RMIT and VGBC 2009). Hanoi has hosted upgrading projects, but heritage conservation restrictions add an additional layer of complexity and often hamper these efforts.
- **Unplanned dwelling areas:** In Hanoi and HCMC, both illegal and legal housing encroach on ditches or canals, blocking drainage (Phan 2008; RMIT and VGBC 2009). A storm in October 2008 inundated large portions of Hanoi, with many streets under a metre of water for days.
Rural-urban migration has proceeded rapidly since Doi Moi (Sang 2008). Migrants generally cannot buy or rent a house in central areas, but can find employment in factories and industrial parks located in peri-urban areas, where most of them settle (Giang 2008; Noltze 2008). Migration patterns in Hanoi and HCMC differ: in Hanoi economic migrants usually do not bring their families, stay in temporary quarters and return frequently to their villages (Boothroyd and Nam 2000). In HCMC immigrants tend to settle in the city due to its wider range of enterprises, industries and opportunities. HCMC has witnessed a remarkable change in its urban structure and housing due to migration. Firstly, urban areas have expanded spontaneously through constructions by new arrivals (Giang 2008), typically housing with small floor area of 20-30 square metres, cheap materials and short life (Giang 2008; Noltze 2008). Secondly, a large number of migrants cannot afford to build and the only solution is to rent. Rental property for migrants is divided into many small rooms with limited or non-existent services (such as toilets), a situation with negative implications for residents and the wider urban community (Huy 2003).

Compact, high-density, mixed-use developments are often proposed under sustainability principles (Storch et al 2008; Moghtin and Shirley 2005). However in Vietnam, extremely high densities alongside much lower densities often reduce social sustainability and usher in inequity. As mentioned, secondary effects of neoliberal market reforms have catapulted land prices, leading to shortage of affordable housing for a large segment of the urban population (Giang 2008; Hanoi UAC 2004; Ludovic and Laurent 2003; Hoang 2007). As a result, residential areas in inner districts of both cities are extraordinarily dense. According to Hanoi UAC (2004), 30% of its people live in cramped apartments with an average living space of three square metres per person. This figure has shrunk from six and a half square metres per person in 1995 and five in 1998. Hanoi possesses about 7.5 million square meters of housing space, with a third of it in dire need of renovation or repair. Meanwhile, in HCMC 6% of the population lives in slums according to official statistics, but this excludes those living in sub-standard housing in the inner city - these high-density poor settlements account for another 40-60% of HCMC’s people (Ahmed 2009). Uneven densities in the inner cities have led to sprawling expansion of the cities, a development counter to best-practice principles for sustainability.

The crowded areas of the cities present a complex problem for local authorities. Most people living in these areas, many of which are slums, are rural-urban migrants with an income far too low for hope of property ownership. This first generation of urban migrants, unlike for example the more land-ed group observed in the favelas of Brazil by Perlman (2003), generally perform unskilled labour, surviving on temporary work in the city. As unregistered migrants, they are considered illegal by the government, which thus provides no infrastructure or services. What the government refers to as “social evils” (HIV epidemics, crime, violence, prostitution, drugs and alcohol abuse) appear in some concentration here (Lachance 1997). HCMC hosts an estimated 24,000 slum dwellings alongside canals alone, without taking into account the substantial inner city slums (Vietnam News 2007b), which far outnumber those in Hanoi (Coulthart et al 2007).
Clearance and resettlement has not proved easy. HCMC authorities have implemented slum clearance on the banks of Nhieu Loc-Thi Nghe over the past years, with five-storey apartment buildings built for resettlement, and in 2001 riverbank slum residents in Hanoi began to be resettled in housing projects (Vietnam News, 2009a). However problems soon emerged as home-based livelihoods were lost in the relocation process, and further, many slum dwellers were from outside provinces and not legally registered residents and hence could not benefit from the projects. Many were unable or unwilling to return to their provincial homes and formed new slums elsewhere after eviction. Any compensation received was far too small to buy a house. While shelter is an urgent need, public and private housing construction and resettlement processes are usually too slow for such displaced people.

**URBAN HOUSING POLICY**

From 1954 to 1986, a subsidised, strictly controlled housing policy was followed. This disintegrated after Doi Moi and housing development became tied to industrial growth. To address the shortcoming of market-dominated housing development, new policies were developed for the poor (JBIC 1999). Problematic in conception and implementation, these policies have generally failed to manage the complexity of the housing market. Irregular real estate taxation and transaction mechanisms, and murky land policies have provided benefit to the few, but also caused artificial land shortages, price explosions and the disappearance of low-income housing and affordable housing even for the growing middle class (Waibe et al 2007). Examples of poor regulation include many cases of private companies promising the government to build low-cost housing, but not doing so after being allocated land for their projects.

New decentralisation policies, purportedly implemented to rein in an excessive and inefficient bureaucracy, often serve as entrepreneurial opportunities for local officials, another effect of neoliberal urbanism. Though no statistics are available on the impact of these policies, there is obviously little reduction in bureaucracy or efficiency improvements. Companies with good connections to government officers are offered land at low prices for new urban projects, while collusive violation of construction law is commonplace - these occur at the expense of rational, integrated and sustainable development.

Moreover, even housing policies designed to protect low-income earners have trouble defining their intended beneficiaries. Vietnam News (2009) reports that most low-income projects are for civil servants, soldiers and registered urban citizens priced out of the newly expensive real-estate market. Unregistered migrants, and low-income people working for private organisations or in the informal sector, are ignored. Meanwhile, even the first group of formerly solid middle-class wage earners is not well-served - the complexity of Vietnam's land laws causes enormous delays in public housing development, though private towers with higher rents seem to sprout up overnight (Vietnam News 2009b). The public sector has undertaken negligibly few low-income projects in recent years. Central and local governments often serve as both developer and coordinator - issuing policies and regulations while implementing projects. Yet the rules are often complex and opaque, thus an inadequate system for guidance, implementation and management of housing.

Paradoxically, over-production of housing contributes to dearth of affordable housing as older homes and neighbourhoods are replaced by new ones. Often the portion of new housing designated for low-income earners does not materialise, as typical income is insufficient even when units are set at the lowest possible market price (Vietnam News 2008). Vietnamese people, even those with low income, traditionally try to save or borrow money for house purchase, rather than renting (Geertman 2007; Ha 2002; JBIC 1999), which compounds the problem by making high rents particularly unpalatable. The government's loose management of the housing market also contributes to the problem. Despite much housing being produced in Vietnam's highly speculative market, little of it has been affordable, leading to supply gluts for higher-end markets.

Nor do financial systems meet the housing needs of Vietnam's poor. Housing microfinance is a potentially effective tool, but has not been widely implemented (Noltze 2008). Formal mortgages for low-income homebuyers are not common. Around 20% of housing capital is supported by banks and serves mainly high-income earners, while an esti-
mated 65% of housing developments occur outside the formal housing finance system (Ahmed 2009). The low-income market is viewed as a repayment risk, while low-profit margins and long lead- and cost-recovery times keep investors away - overdependence on market mechanisms has produced urban housing crises. At present, even the cheapest formal sector house is out of the reach of low-income earners; providing unsubsidised housing for the poor remains next to impossible.

**SUSTAINABILITY AND CLIMATE CHANGE**

According to a survey assessing quality of life using sustainability criteria developed by the German Institute of Urban Planning, low-income housing in Hanoi was found substandard (Nguyen 2009) compared to international and Vietnamese housing standards. Existing low-cost house designs generally fail to meet the needs of a contemporary community in a tropical climate. According to a study by the authors (RMIT and VGBC 2009), most low-cost homes in Hanoi are badly designed and sited, use poor materials, and lack natural light, ventilation and thermal comfort, indicating that 'sustainable development' is far beyond current conditions in both cities, especially for low-income housing; conception of the term 'sustainability' was vague among most officials and households interviewed.

The conditions of the housing market currently hamper the development of infrastructure, quality housing and supporting institutions; impacts on the urban environment include serious water, air and noise pollution, inadequate sanitation and flooding. Although a "blame the poor" stance characteristic of what Roy (2009) and others refer to as "bourgeois environmentalism" is often a tool for land grabs and redevelopment, it must be noted that unplanned slum housing magnifies these issues. In many slum areas along the rivers and canals, solid waste and effluents are discharged directly into the water system, causing serious pollution (Ahmed 2009; Anh 2007; Girard 1995). However the environmental impacts of Vietnam's uncontrolled urban development are certainly not limited to poor households.

Meanwhile, Vietnam is expected to be impacted severely by climate change and already experiences more intense storms, frequent flooding and higher temperatures (Dasgupta et al 2007; Brundenburg 2008). Storm surge and tidal flooding are of special concern in low-lying HCMC, with surges along its coastal areas already exceeding one meter, commonly inundating large sections of the city. Here the urban poor are on the frontline of climate change: 39% of poor households experience direct impacts, with indirect impacts on most of the remainder (ADB et al 2009). Vietnam's inability to spatially control its rapid urban development and provide adaptive infrastructure has increased vulnerability to climate change among all social groups.

As Hanoi and HCMC revise their urban development master plans for 2020, they have not ignored this danger. While Hanoi has drawn up an overlay hazard map, it focuses only on floods and co-located socio-economic activities, both based on current levels. No long-term future plan exists and Hanoi's urban planners devote little attention to climate change risks and adaptation (Brundenburg 2008; Hung 2007; Martin 2008) - especially with regards to poor, informal riverside communities, the groups affected most and earliest by flooding and storms. Meanwhile, HCMC has no unified information centre and poor data collection and storage. Access to disaster information is highly restricted; despite public demands for more transparency, there has been little progress. Important information is only available through informal channels (Tanner and Mitchell 2006).

Technological adaptation strategies under consideration by government and non-governmental bodies face great obstacles due to their novelty, cost, and disruptiveness (ADB et al 2009). However a 'no-regrets' strategy of increasing the physical resilience of low-income housing, in particular flood- and climate-proofing, should be emphasised. Making these homes less water and energy intensive, and designing them with passive principles will yield sustainability co-benefits as well.

Sustainable low-income urban housing in Vietnam is a highly complex issue; simplistic solutions will not achieve success. A holistic, or systems, approach must be taken, one that includes economic, social, technical and environmental consideration. Those strategies that respect the local culture and context, and protect Vietnam's housing market from globally enforced structural disparities, will likely prove most effective. Strategies that acknowledge the complexity of housing problems...
and can contribute to urban sustainable development in all its dimensions are suggested below.

**Modularity**

Low-income housing must meet future as well as current demands, given a growing population. Much spontaneous, illegal land-use and building expansion in Vietnam result from the traditional multi-generational household pattern. Research into housing morphologies that enable alterations according to occupants' needs without sacrificing quality, safety and sustainability is thus crucial.

**Location**

Planners should encourage compact, mixed-use and transit-oriented development that reduces transport energy, emissions and investment while maintaining Vietnam's vibrant urban communities. Social sustainability is a key concern of many residents; in-situ upgrading of poor urban areas has proven far better than relocation.

**Mixed-income communities**

While the trend of neoliberal urbanism draws away from economically mixed communities (Graham and Marvin 2001), they are generally thought to produce healthier cities (Jacobs 1961). In addition to greater local economic interdependence, such mixing presents opportunities for social cohesion and, for the lower-income groups, mobility. Meanwhile spatial segregation of income groups leads to marginalisation and decay of lower-income areas.

**Integrated smart design**

It is possible to design more comfortable and sustainable housing without significant cost increases. Appropriate technology, holistic and integrated design approaches should be emphasised. A key example would be passive design features that use natural ventilation and light, thermal mass and good insulation. Realising cost savings is another way to increase the 'green' budget: the normalised expense of construction and maintenance is usually 40-50% higher for high-rise buildings (more than 10 stories) than for low-rise buildings (Harris and Frank 2004). Prefabrication can reduce construction costs by 20% (Roger 2002), commonly used in pre-Doi Moi subsidised housing in Hanoi, but here low cost was overshadowed by low quality, unsustainable design and lack of modularity. With these negatives addressed, prefab could free up budget for higher quality, environmentally friendly materials.

**Typology**

Schramm (2003) proposed high density low-rise housing (5-6 stories) as a sustainable typology for low-income communities, though the form should not be seen as an answer in itself, but as one dimension of sustainability. This will likely prove a suitable model for Vietnam (Thiem 2001) due to its familiarity with row and shop houses. Multi-functional shop housing is characteristic of those relying on income from informal activities (Noltze 2008), thus integrated work spaces should be included. Here flexibility is a key issue.

**CONCLUSION**

Three main factors make urban low-income housing an issue of growing concern in Vietnam. One, many people still live in old, dilapidated government-built housing that has not been maintained. Two, real estate speculation has sent urban land prices rocketing upward; finding adequate housing is a struggle for the urban majority, including the middle-class. This leads to extensive informal housing developments, which in turn brings a host of problems. Three, rural-urban migration is presenting serious challenges for sustainable urban development. In league with the previous factor and loose regulation, this brings an uncontrolled pattern of settlement development with various social and environmental impacts. These factors must be considered in a context of inadequate institutional capacity: growing oversupply for some segments, lack of market research, inadequate concern for affordable housing development, poor planning and building management systems, widespread environmental pollution and disregard of climate change issues.

Local housing authorities must secure community involvement, housing standards, finance and land provision, and infrastructure. Better coordination of policy and planning, including regulation, should beget more affordable, sustainable housing construction. Housing must be seen as a multidimensional, multi-stakeholder policy field with interrelated levels of intervention. An integrative level of management is necessary where ‘silo’
thinking and management is still the norm. Low-income communities themselves should ideally be involved in public planning - while Vietnamese law provides mechanisms for this, they are rarely invoked (Robert et al 2005; UNDP 2006). Low-income groups must also not be held hostage to the interests of investors, as is commonly the case in neoliberal urbanism. If the government cannot create policies that produce private investment for low-income housing, it should become the principal investor. Indeed, government funds, which normally require a lower rate of return over time than private funds, may require fewer trade-offs between quality/sustainability and cost. Further, as informal housing comprises a large amount of the urban housing stock, the government must consider how it might retrofit or redirect self-built housing to meet sustainable urban development goals, for instance setting criteria for health, energy use and climate proofing, and providing financial incentives in return, such as subsidised long-term loans.

Existing urban development instruments cannot cope with these issues, perhaps requiring a change of perspective. Housing is not merely a social-welfare issue, but also a production sector able to absorb labour, generate jobs and support socio-economic development - clever policy could unleash this potential. Yet too many overlapping agencies jointly manage, partly manage, or attempt to wholly manage the housing sector and its various aspects, including land management, construction, purchase, sale, property transfer, maintenance and taxation. No lead agency provides overall guidance; the result is an ineffective housing management system. To address these problems, holistic sustainable strategies should be considered, following a multi-dimensional approach that includes socio-economic, cultural, environmental and political aspects. Urban policies must be revised to concentrate on the problems of the great mass of low-income urban dwellers, and to limit the worst effects of neoliberal urbanism.

Much remains to be done in the legal and economic fields to promote the development of sustainable, low-income urban housing. The objective of low-income development is not simply to increase the quantity of housing. It must be an integrated approach, in which housing production aids sustainable urban development and enhances the life and prospects of all city residents.

REFERENCES

ADB (Asian Development Bank) et al 2009, Ho Chi Minh City Adaptation to Climate Change (report). Hanoi, ICEM.

AHMED, I. 2009, Sustainable Built Environments in Hanoi and Ho Chi Minh City (scoping report). Melbourne, RMIT University.


BRUNSENBERG, H.S. 2008, Adapting Ho Chi Minh City for Climate Change: Urban Compactness – A Problem or Solution? Cottbus (Germany), Department of Environmental Planning.


GIANG, L. N. H. 2008, Housing Solutions for Immigrants in Ho Chi Minh City (report). HCMC, Department of Planning and Architecture.

GIANG, L. N. H. 2008, Housing Solutions for Immigrants in Ho Chi Minh City (report). HCMC, Department of Planning and Architecture.

Iftekhar Ahmed, Jalel Sager & Le Vu Cuong


LUDOVIC, D. and LAURENT, P. 2003, Low-Cost Housing in Ho Chi Minh City, Vietnam. Ho Chi Minh City, ME Co. Ltd.


NGUYEN, Q. M. 2009, Sustainable Meets Affordability to Ensure Accessibility to New Urban Housing Projects in Hanoi (Vietnam) (PhD thesis). Germany, Faculty of Architecture, Bauhaus University Weimar.


Authors’ Addresses:
Iftekhar Ahmed, RMIT University, Melbourne, Australia
Ifte.ahmed@rmit.edu.au

Jalel Sager, University of California, Berkeley, USA
jalel.sager@gmail.com

Le Vu Cuong, Vietnam Green Building Council, Hanoi, Vietnam
levcuongarc@gmail.com
Abstract
A major aim of the design studio is to educate students to be well-equipped designers. To do so, a student should be able to grasp the divergent information of various courses and integrate that knowledge into their design problems. But are students aware of the emphasis placed on incorporating different curriculum courses into the design studio? Do they find it beneficial while developing a design project? To what extent do they think this integration has an impact on their success in the design studio and in their adaptation to professional practice? This paper seeks to find out whether the integration between the design studio and other curriculum courses is productive from students’ perspectives and determine if there is a consensus between students and instructors on the significance of transferring knowledge from curriculum courses to design projects. In addition, the paper examines the position of the design studio as an integrative medium between education and practice in the Turkish context.

Keywords: Design Education, Design Studio, Curricular Integration, Lecture Courses.

INTRODUCTION

Interior design/architecture curricula is composed of various courses that ponder historical, social, cultural, aesthetic, technical, and other related subjects along with the design studio, which is usually assumed to be the core of the curriculum. The basis for this assumption is widely rooted in an understanding of the design studio as a potentially productive environment in which students can incorporate different components of the curriculum within the body of a project. A major aim of the design studio is to educate conscientious future designers who can think critically and are well equipped in the areas of design. Arguably, a design project fed with technical, social, cultural, aesthetic, historical, and related knowledge attained from different curricula courses better prepares students for their contributions to the built environment. This preparation is especially critical in professional degree programs, where students are granted the right to practice upon graduation without further qualifications such as post-graduate internships and licensing or qualification exams. Turkish architectural and interior design/architecture schools exemplify programs that educate students as immediate contributors to the built environment. This situation raises the question of whether the concepts of interior design/architecture education (e.g., principles and elements of design, space planning, human factors [ergonomics, anthropometrics], construction systems, lighting design, interior materials and finishes, product and furniture design/theory/history) are being properly addressed to prepare students for real-life situations (Gürel and Potthoff 2006). For both educational and professional purposes, it simultaneously raises another question of whether the formats of the lectures, where these essential concepts are taught, need to be restructured.

Gelernter points out the difficulty of students’ relating their experiences in the lectures to their experiences in the studio. He argues that even though students are confronted with various courses, such as building technology, culture, human behavior, few of that knowledge is affecting directly their projects in design studios (Gelernter 1988).

Furthermore, to educate students as immediate contributors to the built environment intensifies a concern with regards to bridging the so-called gap between education and professional practice (Mitgang 1999; Boyer and Mitgang 1996) and sparks discussions on the nature and the significance of this gap (Bunch 1993; Bovill, Gardner and Wiedemann 1997; Cuff 1996). The curricular...
structure and instructional methods provoke this gap. In this context, the instructors are ‘accused of being too theoretical and unconcerned with the realities of practice’ (Wilkinson and Salama 2007). Arguably, a design studio loses its value as an educative and creative medium if it functions as a replica of an architectural office (Teymur 1992). But on the other hand, a design studio runs the risk of abstraction from real-life situations if it operates autonomously; and if it merely focuses upon the hypothetical design problems in which many contextual variables that are influential on real life situations, are ignored (Salama 2008). Schön (1988) defines the studio as a ‘practicum, a virtual world representing the real world of practice, but relatively free of its pressures and risks’. In point of fact, the interaction between a design project’s artistic, theoretical, and realistic concerns has the capacity to enrich students’ educational experiences. It also better prepares prospective professionals for practicing their profession. We suggest that a contextual study that examines the role of a design studio in a Turkish interior design/architecture program from the students’ perspective would contribute to the discussion of the relationship between education and practice.

Both theoretical and technical lecture courses provide the essential knowledge without which design activity would be ‘random and arbitrary’ (Gelernter, 1988). Actually, for over a decade in our interior architecture and environmental design program, we have observed that those students who can transfer knowledge acquired in curricular coursework to their design projects build confidence that helps them in professional practice. Thus, we emphasize the value of the studio as an integrative medium that merges knowledge learned in different courses of the program. This value is especially underscored in the third- and fourth-year design studio courses, during and after students acquire an understanding of building systems, construction techniques, environmental control systems, fire prevention, acoustics, lighting, and the use of appropriate materials, finishes and objects, including furniture and fixtures. These years are also when students are exposed to coursework on social and cultural issues, history of the built environment, ergonomics, and anthropometrics. We encourage students to apply the knowledge from their curricular coursework through implementing course objectives and goals, requirements of the design project brief, design critiques, sketch problems, lectures, and the evaluation process that occurs throughout the semester and at the end of the course. In addition to these tools, we implement a rotation system that allows students to receive critiques from a number of instructors, usually with different areas of expertise (e.g., construction, lighting, and history of the built environment), of their design project. At the end of each semester we also aim to compose a heterogeneous final review committee or design jury that emphasizes all aspects of a project, ranging from conceptual formation and artistic integrity to whether the project is doable. This teaching approach seeks the balance between the content and concerns of design and the issues of the built environment that feed them and education in general. It aims to raise a student’s awareness of the value that lies in this balance.

BRIDGING THE GAP BETWEEN EDUCATION AND PRACTICE IN THE STUDIO

Observing the construction activity in Turkey helps to understand why there is a need for integration between education and practice. Turkish cities are experiencing rapid urbanization due to the ever-increasing population and never-ceasing migration. For example, the capital city of Ankara, which had a population of 74,000 in 1927 (the date of Turkey’s first census) (Tekeli and Güvenç 1986), in 2009 has a population of 4.5 million. The situation in Turkey’s other major centers such as Istanbul, İzmir, Antalya, Bursa, and Konya is similar to Ankara’s. Such enormous growth patterns depending on fortuitous locations and advantageous local conditions of some urban centers (Mulligan and Crampton 2005) invite reflection on the cities’ physical characteristics. Because of the continuing demand for new housing and public buildings the construction sector has grown three times faster than the Turkish economy (YEM 2007). This growth activates the construction sector positively, however, demand is inadequately met, which has led to an output of low quality, low budget building stock that is often detached from the social, cultural, environmental, and urban context. Dense construction activities that are accompanied by problems of licensing, building codes and standards, and political mismanagement, inevitably result in a built
environment of low quality. This picture, then, may ask design education to be more concrete and to focus more on the social, cultural, and environmental facts. As Norberg-Schulz (1988) states, students should understand that ‘building’ means more than constructing houses of a certain number of meters square. He suggests that education should enrich the ability of integration, analysis, and experience. He adds: ‘...[education] must also furnish the general, cultural background necessary to give the intentions of architectural production an adequate depth’ (219).

In his study on knowledge integration in architectural design studio, Salama (2008) asks a critical question of whether the current system integrates different types of knowledge needed for the successful creation of the built environment. If the aim is obtaining integrative knowledge, it is to be critically thought upon how more effective teaching-learning methods can be developed and how ‘real life issues’ can be established in lecture courses. He stresses the important role of learning from the actual environment and argues that ‘real life’ experiences offer students opportunities to comprehend the practical realities and different variables affecting ‘real life’ conditions. However, as Salama states, in design studios, students are mostly offered hypothetical design problems, where inevitably a number of contextual variables are neglected. In countries like Turkey ignoring real-life conditions in the design studio marks a fallacy. Accordingly, the design studio, where future practitioners are educated, should position itself in a dominant role of improving Turkey’s physical environment. The demand for ‘more relevant and responsible practice’ (Schneekloth and Shibley 2000) is logically consistent if a multi-dimensional design understanding including social, cultural, technical, and historical matters, gains currency in the design studio. When connected to those dimensions in each step of design process, the design studio could claim a wide-ranging effect on real life. Socially conscious, environmentally concerned, and historically informed future designers seem to fit the profile for responsible design activity. No doubt such designers will contribute to positively shaping the future physical environment and constitute a powerful body for influencing the existing one.

Design can be viewed as a practical form of inquiry by which the ideas of dwelling and settlement are realized and shaped (Rowe 1991). According to Johnson (1994), for flair and creativity, architects need to be practical above all. The architect’s role has always been to combine artistic and practical aspects. Johnson stresses that the challenge of architectural education is to achieve a balance between these aspects. As Jones (1996) states studio teaching is an integrative process through which various aspects of the discipline, technical or cultural, should be considered. Also, all of these aspects and design should be comprehended in relation to each other. He rightfully mentions that in the design studio ‘knowledge is tested in context, in active engagement with a task’.

If enriched by the knowledge attained from other curriculum courses, the design studio, as the core of design education and where artistic aspects are addressed, develops a remarkably deeper sense of real-life conditions. These conditions are pertinent to the education of other professional disciplines such as medicine and law (Wheelwright 2004). Various studies point out the importance of emphasizing user needs, human factors, and technical, aesthetic, environmental, cultural, and social issues, as well as historical and urban contexts in the design studio (Kim 2006, Cunningham 2005, Chi 1999, Kucker 1997, Davies 1996, Siedel 1981). A design studio that is abstracted from any of these considerations fails to cope with the complexity of the practice. Integrating coursework with the studio equips students with the ability for synthesis that seems to be an essential resource for practice. Examining their projects through the lenses of various topics helps students experience the projects from these various viewpoints and on various scales. For instance, historic artifacts can be investigated for design purposes in order to obtain a socio-cultural framing of the studied project (Antoniades 1992). Based on these arguments, interaction among courses is not merely an educational tool; rather, it can help establish a relationship between the field of education and the realm of practice.

As discussed above, a design studio must be adequately connected to real-world conditions (Huge 2009) to become an instrument for change. And, the knowledge attained from other courses must make students better understand the client needs, construction problems, property values, public concerns, contractors, regulations, standards, and many other components (Schermer 2001) of a project. Understanding the importance
of these components prevents design from being perceived as an isolated activity in the minds of students, and blurs the distinction between the design studio and the real world. Academia in general, and design studios in particular, should feel the pressure of responsibility to better the quality of the built environment. This brings out the question: Through which mechanisms can a fruitful integration be achieved?

INTEGRATION AND STUDIO DYNAMICS

In our institution a great amount of effort is invested to realize the integration discussed above. A major focus is on the rotational teaching method. This system reinforces a pluralistic learning environment by replacing the traditional master-student relationship. It exposes students to knowledge and critiques from instructors who specialize in various fields such as history, theory and technical issues. Engagement of their different backgrounds (such as; architects, interior architects, industrial designers) with their specializations, studio instructors propose various visions to students.

Another mechanism of integration is the project briefs prepared by the instructors that include objectives for each level. These objectives emphasize the transfer of the accumulated knowledge of various courses to the design projects of that year. For example, in the third-year studios, students are expected to refine design solutions by drawing design details on various scales, which is taught in Detailing Studio. Similarly, in the fourth year, students are expected to generate production drawings in the studio as they learned them in the course of Interior Design Documentation (figure 1, 2 and 3).

Another way of integrating studio and coursework is including topics such as lighting, construction, and human factors, directly to the studio agenda. This can be achieved by inviting a guest to speak. Interweaving the projects with a subject gives the student a strong message that design is not an isolated operation. For instance, when the student
examines her/his design project in terms of ‘lighting’ general manipulations about the lighting quality of the designed space evolve into specific considerations. Studying an aspect of the design project in related curriculum course complements integration. A small part of the coursework can be dedicated to applying the subject matter to the design project. Such an application helps students to better understand the course subject as they find occasion to connect the theoretical knowledge with their projects.

‘Final jury’ is the last stage of the design process in the studio, in which the student explains her/his project via an oral and visual presentation, and responds to questions and objections from a jury of instructors (figure 4). The process and the final stage are intimately linked, and neither can be formulated and carried out independent from the other. Tendency towards the integration of the design studio and other courses is also a matter of final jury composition. The effort to make a heterogeneous jury member composition is rooted particularly in the prevailing consensus on the understanding of integration. Jury members with a varying range of scholarly interests and intellectual concentrations stimulate the jury process with fresh viewpoints. One of the chief advantages of such plurality is that it inevitably provides for an expanded realm of evaluation. It diverts attention from the customs and commitments of the studio to different domains, and those insights force the student to consider her/his proposal in various contexts even at this final stage.

Evaluating the studio process (through sketch problems, pre-juries, and the final jury) is important to convey certain messages. In our program, developing the design ideas with the knowledge gained in the curriculum courses seems to be the most important component of success in our design studio. Objectives of design studios that are introduced in the project briefs can only be thoroughly fulfilled by the achievement of the integration between courses. Accomplishing the multi-faceted objectives improves academic quality in the design studio and plays an important role in evaluating the design project.

METHOD

Interviews with design studio instructors
Improving academic quality requires a consensus on the teaching/learning system between instructors and students. This study aims to determine if there is a consensus on the significance of transferring knowledge from curriculum courses to a design project. In order to do this, we interviewed third- and fourth-year design studio instructors. They were asked whether they expected students to transfer knowledge attained from other curriculum courses to their design projects to improve the mentioned relation, if this affected students’ performances in the studio and their suggestions for the improvement of this integration.

Questionnaires and interviews with students
Students have an active role in applying any method of instruction (Littmann 2000). Recognizing the importance of this active role, the study concentrates on third- and fourth-year students’ opinions through a questionnaire and interviews that seek to determine the students’ awareness of the significance of integration. The study excludes first- and second-year students because those students’ recognition of the studio as an integrative medium is likely to develop only at the end of their second year.

A survey of five questions was distributed among 121 students. The first question seeks to determine if, according to the students, there is a relationship between the design studio and other curriculum courses. The second question asks whether the students transfer knowledge from other curriculum courses to the design studio. The third question aims to clarify whether the knowledge attained in other curriculum courses affects their...
performed in the studio. The fourth question investigates whether students recognize the instructors’ expectations of integration. Lastly, the fourth-year design students are asked to rank courses according to their impact on a project’s development.

Interviews were held with students grouped according to their performance in the studio. The interview was composed of six questions. The first question aims to discover if there is a significant difference between students’ successes in the design studio and other curriculum courses. The second question asks if there is a relationship between their performance in the studio and other courses. The third and the fourth questions are related to the students’ observations of the instructors’ positions in the studio. They investigate if the instructors’ backgrounds affect the way he/she approaches the development of a design project and if it influences his/her set of criteria in the evaluation process. The fifth question asks students to indicate the courses that support the development of a project. The last question investigates other factors that influence the success of developing a project.

**FINDINGS**

**Interviews with design studio instructors**

The results of the interviews show that the third-and fourth-year studio instructors recognize the importance of integration in students’ performance in the design studio. They state that lack of integration results in less-developed design solutions, however, they observe that students often experience problems in connecting curriculum courses with the design studio. An instructor proposes that students should not be allowed to take a design studio before finishing previous years’ required departmental courses. One suggests that demonstrating the knowledge attained from other departmental courses should be a criterion during a project’s final evaluation. An instructor identifies the lack of connection problem as compartmentalization of knowledge; that is, locking knowledge in one domain and not transferring it to another. An instructor shared a recent observation that students could not apply lectured information to their design task, which immediately followed the lecture. Issues such as environmental and socially responsible design should be central in the studio, but this can only be achieved with the support of corresponding departmental courses. On the other hand, another instructor points out that while the design studio should embrace the curriculum knowledge it should give priority to creative thinking. While all of the instructors agree on the importance of integration among courses, they also point out that the integration should be among all courses of the curriculum. This is to say that integration should not only be expected in the design studio, but also in other courses. Design studio issues can be examined through sketch problems or different types of exercises.

**Questionnaires and interviews with students**

Findings in the second phase of the study (questionnaires to and interviews with students) demonstrate that students largely understand the significance of the interaction between the studio and other curriculum courses. Responses to the first question (Is there a relationship between the design studio and other curriculum courses?) show that 26.85% of all students ‘frequently’, 51.61% ‘occasionally’, 20.62% ‘sometimes’, and 0.91% ‘never’ relate the design studio to other curriculum courses (from now on the given percentages are an average value of all the students’ responses) (Figure 5). Correlations related with the first question are valid only for the fourth year students. This shows that students at higher levels are able to develop an understanding for the various impacts of transferring knowledge on the design studio.

Responses to the second question (Do you transfer knowledge from other curriculum courses to the design studio?) indicate that 17.06% of all students ‘frequently’, 45.52% ‘occasionally’, 35.73% ‘sometimes’, and 1.68% ‘never’ transfer knowledge from other curriculum courses to the design studio (Figure 6). There is a significantly positive
correlation between the first and the second questions for the fourth year students (Table 1). Consequently, if students connect the design studio with the content of another course, they are more likely to transfer knowledge from that course to the design studio.

Responses to the third question (Does the knowledge attained in other curriculum courses affect your performance in the studio?) show that 21.05% of all students 'frequently', 40.42% 'occasionally', and 38.53% 'sometimes' think that the knowledge attained in other curriculum courses affects their performance in the studio (Figure 7). None of the students indicate 'never' for this question. The correlation between the second and the third question is positive and statistically significant both for the third and the fourth year students. Those students who state that they transfer knowledge from other curriculum courses to the design studio also state their awareness of the influence of transfer of knowledge to their performance in the studio (Table 1 and Table 2). The first and the third questions are positive and statistically significant only for the fourth year students (Table 2).

Table 2 shows that if students relate the design studio to other curriculum courses they also claim their awareness and comprehension of the influence of transfer of knowledge to their performance in the studio. This relationship can also be observed in the final stage of the design process. In the final presentations the projects, which have the capacity to reflect their knowledge in other courses, can end up as successful proposals.

In response to the fourth question (Do you recognize the instructors’ expectations of integration?) 54.90% of all students ‘frequently’, 33.63% ‘occasionally’, and 11.46% ‘sometimes’ recognize the instructors’ expectation of integration (Figure 8). The fourth and the second questions are significantly positive correlation, which is only valid for the fourth year students (Table 2). This shows that those
students who state that they transfer knowledge from other curriculum courses to the design studio also state that they recognize the instructor's expectation of integration.

The findings of the last question (Name the five courses that have the most impact on the development of your project) indicate that students mostly feel the technical drawing courses have the most impact. This finding shows the importance of the visual presentation during the studio process (and correlates to findings of Gürel and Basa's 2004 study). Classes that equip students technically, such as construction and materials courses and building performance courses (lighting, acoustics, plumbing) are identified as second-most important to their projects. Even though most students prefer using computers for presenting their projects (Senyapili and Basa 2006), computer aided design courses are ranked third in importance. While the detailing of a project is a major issue in an interior architecture studio, the courses supporting this knowledge (such as detailing studio) are not considered of major importance in the design studio (Figure 9).

Courses that equip students with historical, cultural, social, and environmental knowledge such as history of built environment, history of furniture, art and culture, and people and environment, are considered to have a lesser influence on studio performance (Figure 10). This outcome is striking since project briefs usually emphasize socio-cultural aspects that are discussed during the project development.

The interviews with students support the results of the questionnaire. During the interviews it is observed that students who are more successful in the design studio are usually successful in other courses as well. Students with a better performance in the design studio say there is a strong relationship between their performance in the studio and other courses. Most of these stated that having instructors with different backgrounds positively affect the development of their projects. Students do not feel that instructors' backgrounds influence their evaluations. They consider technical courses as the most supportive to a project's development. Students with a better performance in the studio argue that detailed research on the related subject and observation of the built environment are essential components of success. They also point out that social and cultural aspects are central to resolving a design project. The less successful students did not mention social/cultural courses as effective for the development of their projects.

CONCLUSION

This study explores the efficiency of design studio instruction that places great emphasis on incorporating curricular coursework in the design studio and aims to determine whether students are aware of the importance placed on this incorporation. The findings show that students largely recognize the importance of transferring the teachings of other curriculum courses to the design studio to generate a satisfactory project. Interestingly, students identify a strong connection between the technical knowledge acquired in courses such as construction, lighting design, and building services and producing a successful design project. They also acknowledge a significant connection between visual presentations and successful evaluation of their design projects. Students place secondary importance on how social, cultural, and historical considerations relate to their performance in the studio course. The interviews showed that while students recognized the importance of socially, environmentally, and historically connected design, they do not see a direct
relationship between the courses that teach these topics and their performance in the studio. This suggests that students assume transferring technical knowledge to a design project generates more concrete and visible results. The results of this study illustrate that students are not completing theoretical courses with enough understanding of the historical, social, and environmental factors although the knowledge will lead to future designers with positive contributions to the built environment. This article argues that design studio instruction and teaching methods that stress the transfer of knowledge from different curricula courses better prepare students for their contribution to the built environment. An emphasis on integration between the design studio and curricular coursework is especially significant in those professional degree programs that graduate designers as immediate contributors to the built environment. In Turkey this sector is undergoing intense construction activity and rapid growth, often accompanied by political mismanagement and/or exploitation of land resources, which has resulted in poorly built environments. To improve this environment and to effectively operate in the building industry requires high levels of knowledge, experience, and sensitivity to the problems caused by design and construction activities. As in many parts of the world, in Turkish universities students earn the right to practice immediately upon graduation without further experience or qualifications such as post-graduate internships and licensing or qualification exams. This places a big responsibility on professional architecture and interior architecture programs to educate individuals who can undertake such professional tasks.

The results confirm that the integration problem does not stem from students' attitudes. However, it persists despite a significant degree of student awareness and instructors' emphasis. It appears that Gelernter's (1988) sharp criticism on the curricular split between lectures and studios in schools of architecture is still valid after more than twenty years. As Gelernter points out, this split is the result of a misassumption that students first get the basic knowledge in lectures, and then use this knowledge in the studio. Design and lecture instructors' (as well as students') attempts to ‘reconcile lectures and studio' may not sufficient to bridge the gap but their awareness suggests a demand for restructuring various components in an integrative framework. Proposals for alternative curricular formations (Fernando 2007, Salama 2008, Teymur 1992, Gelernter 1988, Schön 1988) should be taken into consideration in order to obtain an alternative integrative medium of knowledge in the design education. However, in doing this it is important to remember that theory, social science, and technical based courses are 'equal partners' of the design studio and not the 'supporters' since, adjusting the content and the methodology of the courses according to the benefits of design studio would put them in a weak and 'less specific' position (Teymur, 1992). In this respect, keeping their equal status with the design studio, content and the application of lecture-based courses should be reconsidered. As this study showed an awareness of students and a demand from the instructors underscoring the need for integrative framework, it opens a discussion for improving interaction between design studio and curriculum courses.

REFERENCES


Authors’ Addresses:
Elif E. Turkkan
Bilkent University, Faculty of Art, Design and Architecture,
Department of Interior Architecture and Environmental Design, Turkey.
eelif@bilkent.edu.tr

Inci Basa
Bilkent University, Faculty of Art, Design and Architecture,
Department of Interior Architecture and Environmental Design, Turkey.
basa@bilkent.edu.tr

Meltem O. Gurel
Bilkent University, Faculty of Art, Design and Architecture,
Department of Interior Architecture and Environmental Design, Turkey.
mogurel@bilkent.edu.tr
INTRODUCTION

This article attempts to address housing sustainability with particular focus on the person-environment relationship in the context of micro scale development, i.e. individual housing unit. According to Choguill (2007), meeting basic human needs is considered as fundamental to the sustainability of human settlement. In order to achieve this, Choguill (2007) stresses the need for user participation in all the stages in housing development. Allowing and encouraging users to be involved in the design and construction of their houses will benefit them in the aspects of both economical and design satisfaction (Mohd Jusan 2010). We can assume therefore, that the five sustainable housing characteristics (availability, quality, economical, ecologically-friendly, comfortable and cosy) as discussed by Maliene and Malys (2008), can only be achieved when the inhabitants are allowed to participate in the creation of their own houses. The significant role of user participation in housing unit design, as Mohd Jusan (2010) posits, is to achieve person-environment congruence (PEC), which is the principle and most important criteria in respect of supporting housing sustainability. This is the concept that the author intends to highlight in this article, and will attempt to explore the connection between housing units' attributes and the user's design expectations, which contribute to the sustainable design of housing units.
ecological-psychology approach, which views environment and behaviour as ecological interdependencies. A good fit or congruence between the person and the milieu, described as “behaviour-milieu synomorph,” is the favourable outcome of the person-environment relationship. Failing to obtain congruence between individuals and the environment may cause psychological stresses.

Studies on PEC in micro scale housing development are, to the author’s knowledge, scarce. The use of the person-environment congruence (PEC) concept can be found in the work of Popenoe (1977), a comparative study of two suburban residential areas in Sweden and the United States. He uses PEC to describe the (expected or favourable) relationship between the environment and residents’ behavioural patterns. However, Popenoe’s works focused on PEC at a community level with an emphasis on environmental sociology, emphasizing social behavior, and working with neighbourhood groups, as opposed to individuals. The results of the study have also not been translated into architectural design suggestions that would be helpful in the design process of a housing unit. Other PEC studies in the field of gerontology by Kahana (2003) and Moore (2005) investigate the impact of the living environment on the elderly residential population and their level of satisfaction. The studies, however, focus on individuals with certain physical disabilities. Studies of the concept of PEC in respect of micro-level housing, with the potential for establishing design suggestions for individual houses, are scarce, thus presenting a notable gap in this context of housing research.

The concept of PEC in the context of mass housing is illustrated by the theoretical model of personalization developed by Mohd Jusan and Sulaiman (2005). According to the model (figure 1), the given environment which is defined by its attributes (Rapoport 2000) will be first filtered and evaluated by the person’s filtration system. The main agent of this filtration process is culture, which encompasses the measurable variables such as values, standards, needs, characteristics etc. (Rapoport, 2000). The consequence of this evaluation process is whether or not the user finds the house as suitable (PEC). There are two ways to cope with conflicting situation i.e. person-environment incongruent. One is to adapt to the situation and remain in stresses, while another option is to modify in order personalize the environment (Bell et.al 1996, Barker 1968). Personalization however is constrained by several factors such as financial availability, market situation, planning and building regulations etc (Rapoport 2000). These constrains are determinants to whether the users move or modify. An important highlight is that, although the users have reached PEC, the situation will not last.
Due to changing needs during their life, they would later find their houses to be inadequate which in-turn forcing them to go through the process shown in figure 1 again.

THE POTENTIAL USE OF MEC IN EXPLORING PEC

The Means-End Chain (MEC) research model from the field of marketing psychology can be adapted for the purposes of investigating the concept of PEC in the field of housing. The model has been widely used in marketing research, in which the results are used for merchandise product design manipulations. In terms of architectural design, this research model is potentially able to offer similar practical advantages. Both PEC and MEC theories focus on the relationship between people and their counterparts, i.e. the environment and merchandise products respectively (see figure 1 and 2). In the PEC theory, the congruence between person and his/her environment is determined by the person’s values, needs, schemata, etc. and his/her environment’s attributes. Similarly, the concept of MEC focuses on the content of the product, which itself comprises an array of attributes offering various affordances to meet the person’s needs and expectations.

In MEC theories, the concept of a person’s value is regarded as the major personal factor that determines people’s decision in selecting merchandise products as well as environmental attributes (Coolen and Hoestra, 2001). According to Rokeach (1972, 1973), it is personal “values” that affect and influence a person’s actions in response to his or her surroundings. Values function as an organized system and are typically viewed as determinants of attitude and behaviour (Olson and Zanna 1993). Extending the Rokeach Value System, Schwartz (1994, 2005) posits that values represent responses to three universal requirements with which all individuals and societies must cope: 1) the needs of individuals as biological organisms, 2) the requisites of co-ordinated social interaction, and 3) the requirements necessary to effect, promote and maintain the smooth functioning and survival of groups.

Rokeach’s (1973) work on "values" provided much of the basic theories of the MEC model developed by Gutman (1982). In Rokeach’s Value System, the distinction between preferable modes of conduct and the preferable ‘desired’ end-state of existence, is a distinction between values representing "means" and "ends," and between instrumental and terminal values (Rokeach 1972). For example, being hard-working will generally facilitate a person achieving his goal of e.g. a comfortable life. Being “hard-working” here is considered as an “instrumental value,” that is, the mode of conduct or behaviour that serves to achieve a “comfortable life,” which is the terminal value (Rokeach 1973). However, Gutman (1982) argues that Rokeach has not established any mechanisms for translating instrumental values into choices of products or service attributes to satisfy the terminal values. Therefore, a significant modification of Rokeach’s value system created by Gutman (1982) is the transformation of the system into a mechanism that allows the preferred end-states of existence to be translated into specific choices in specific situations.

The Means-End Chain is a theoretical and conceptual structure aimed at connecting consumers’ values with their behaviour (Gutman 1982). To date it has been utilized to explore consumer-merchandise product relations. It also furthers the understanding of consumers’ perceptions of the outcomes of product use and consumption (Peter et al 1999; Reynolds and Gutman 2001), hence the connection between consumer and product. The connection is explored through the
construction of a simple associative network of product attributes, consequences, and finally, consumers' values (Figure 2).

Figure 2 shows that product attributes are means through which consumers achieve their ultimate values via the positive consequences or benefits obtained from the attributes. In other words, products and services are seen as a means to satisfy needs of which consumers are conscious about to varying degrees.

Another new component introduced in Gutman's MEC as an extension of Rokeach's Value System is "consequence," which is considered to be more relevant to terminal values than instrumental values (Gutman 1982). The meanings of products' attributes are given by their consequences, namely, what a consumer feels after consumption (Chin 2002). The willingness of consumers to repurchase the same product is determined by the consequences of the product's consumption (Chin 2002).

A question arises as to whether the model can be used to relate people to the environment. Simon et al. (1987), as reported by Coolen and Hoekstra (2001), stress that the process of choice is a dynamic process in which people determine their objectives on the basis of their values, search for suitable solutions, evaluate these solutions and finally make a choice. Coolen and Hoekstra's (2001) work on housing preferences indicates that people's choice behaviour related to merchandise products (e.g. beverages, meat, toothpaste) and services, which has been the focus of the MEC framework, is similar to their choice behaviour with regard to housing.

Mass-produced houses are also a kind of "product" designed by architects, similar to other industrially designed products. The mode of the products' visual consumption, as discussed by Crilly et al. (2008), can be applicable to the 'consumption' of houses. The differences are that houses are much bigger in scale than most merchandise goods, and contain more varied and complex attributes. A house’s attributes include the physical and environmental setting; it is made of walls, ceilings, doors, windows, and decorations. These attributes are perceived individually and as a holistic composition, which make a house far more meaningful to users than merchandise goods. The consumption is not limited only to visual perception but it also encompasses people's experiences of the microclimate, e.g. thermal comfort, and the performing of activities. "Consequence" in this context can be referred to as a person's feeling after experiencing the environment.

Like merchandise products, the attributes of a house can be assumed to lead to various benefits or consequences that in turn meet or don't meet user values. With some modifications, Gutman's MEC model can be utilized to explore which house attributes are linked to which user values. Another question to be addressed is how the MEC findings would determine the achievement of PEC? Mohd Jusan (2007) states that PEC is considered as having been achieved when the house attributes fulfill the standards set by the user-values (the person’s filtration system). The attributes are those that produce positive consequences and are linked to certain personal values.

METHODS

The application of the MEC research model in exploring PEC was carried out on renovated medium and low-cost single storey houses in a mass housing scheme in Malaysia. The selected housing scheme for the study was developed through the formal mode of housing delivery (by a private developer), and was built according to the Malaysian housing policies, planning and building regulations. The houses were provided for the lower and middle income group. The scheme represents the typical mode of mass housing development in the country. In this mode of housing delivery, the original design of the houses is often developed by private developers without involving the actual users (house-owners). Dissatisfaction with the original house design has contributed to the widespread renovation practice in housing schemes developed in this way (Mohd Jusan, 2007). Renovated houses were, therefore, selected for this study because the design and construction of the renovation works are often carried out by directly involving the actual residents of the houses. The achievement of PEC, and the significance of user participation can be investigated and demonstrated by studying the changes made to the original house design.

The MEC data were elicited from 15 respondents representing 15 renovated houses (cases). It was established that these respondents were, as a result of a quantitative survey carried out earlier, found to be either satisfied or very satisfied with the
outcomes of their renovation works. The houses studied were renovated with the intention of personalizing their living environment. The small number of houses selected as case studies was due to logistic reasons; firstly, the data collection process for each house took a long time. At least one hour was required to identify and record the changes made to the original houses, followed by an average, a one hour interview with the head of each of the households. Secondly, data analysis was carried out manually using the traditional methods described by Reynold and Gutman (2001), which was laborious and time consuming. Therefore, by selecting a smaller number of houses, the work became more manageable. Also, as a case study research, the analysis of the data was based on the frequency of mentions not on the number of respondents, therefore working with a small number of cases is, under these circumstances, acceptable.

Data Collection
The MEC method for measuring PEC was derived from the traditional MEC method (Reynold and Gutman 2001) and the modified method of Coolen and Hoekstra (2001). The data collection process takes the form of a semi-structured interview (known as a laddering interview), and is aimed at probing the respondents' own perception of the attributes-value-consequence (A/C/V/) elements.

The major deviation from Reynold and Gutman (2001) applications of MEC was the method of collecting data, particularly the technique used in eliciting key distinctions of the products studied. In the study, the phrase, "key distinctions" refers to a house's attributes (space, decoration, ambience, design components, etc.), which are emphasized in the process of personalizing a house. The original house design was found lacking the provision of sufficient positive consequences, hence it failed to link to or connect with the user's values. In such a situation the process of house renovation was inevitable as owners chose to personalize their living environments. Therefore, the process of elicitation of emphasized house attributes did not follow the traditional method of eliciting the key distinctions, using namely Kelly's Triadic Sorting, Preference-Consumption Differences, and Differences by Occasion as described by Reynold and Gutman (2001). Instead, elicitation by identifying the modified house attributes.

This process was carried out by comparing the original design of the houses with the modified ones. The original design of the houses was obtained from the local authority, while the personalized designs (in the form of visual data - plan drawings and photographs) were recorded during the researcher's visit to the houses. This process took place before the interviews began. The visual data was used by the interviewer to recognize the pattern of modification of the case-study houses. In this way, differences between the original and the modified house attributes could be detected easily. An example of the studied houses is shown in figure 3. Almost all spaces in the house were relocated, a new covered forecourt was constructed, a new gate and fencing were erected, and new floor finishes were installed in all the spaces.

Once these data was established, the respondents were asked what attributes they had emphasized in the personalization project. The responses were compared with the physical changes made on the house attributes, in order to identify any inconsistency exist between the two different sources of information. If any inconsistency found, the respondent would be asked for clarification. Having established the emphasized attributes, data elicitation was continued with elicitation of the "consequences" achieved from the modified attributes, and eventually preceded to personal "values." All the interviews were tape-recorded.
Data Analysis

The traditional MEC method of analysis consists of four main stages: 1) content analysis, 2) the summary implication matrix, 3) the construction of the hierarchical value map (HVM), and 4) the interpretation of the HVM (Reynold and Gutman, 2001). This study applied the same method with some modifications, particularly with regard to content analysis and the construction of the HVM. The tape-recorded interviews were transcribed into written form for content analysis. Weber's (1985) methods of content analysis were used together with the methods described by Reynold and Gutman (2001), and Coolen and Hoekstra (2001). The unit of analysis used in the study was "word." The elicited data were categorized into three categories, namely "user values," "consequences," and "house attributes" as derived from the MEC theory. The research also applied Schwartz's (2005) value domains to categorize all value elements elicited from the respondents. The interconnected elements of attributes/consequences/values elicited from individual respondents were constructed into ladders (see Table 1).

The ladders are the raw data from which a summary of implication matrix (SIM) was established. The SIM displays the number of times each element leads to another element directly or indirectly. Chains in the HVM were constructed from the SIM. The term "chain" here refers to the sequences of elements in the HVM that emerge from the aggregate in the SIM (Reynold and Gutman 2001). The technique of constructing a single Hierarchical Value Map (HVM) for all attributes as applied in the traditional method was not used in the study in order to avoid losing certain important elements. Instead, Coolen and Hoekstra's (2001) method in constructing HVM was employed. A Hierarchical Value Map for each major emphasized house attribute (major spaces in the studied houses) was constructed separately.

Table 1. Theoretical model of personalization. Source: Mohd Jusan and Sulaiman (2005)

<table>
<thead>
<tr>
<th>NO</th>
<th>ATTRIBUTE→</th>
<th>ATTRIBUTE→</th>
<th>CONSEQUENCE→</th>
<th>CONSEQUENCE→</th>
<th>CONSEQUENCE→</th>
<th>VALUE→</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Living room (B)</td>
<td></td>
<td>Bigger house (SI)</td>
<td>Bigger space (SI)</td>
<td>Space for neighbours' party (CMA)</td>
<td>helpful (religious duty-TD)</td>
</tr>
<tr>
<td>2</td>
<td>Kitchen (C)</td>
<td></td>
<td>Good ventilation (BV)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Living room (B)</td>
<td></td>
<td>Bigger space (SI)</td>
<td></td>
<td>More comfortable (PI)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bedroom (D)</td>
<td></td>
<td>Bigger space (SI)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Kitchen (C)</td>
<td></td>
<td>Bigger kitchen (SI)</td>
<td>Better foodstuff storage (Fal)</td>
<td>Tidy kitchen (PF)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Forecourt (A)</td>
<td></td>
<td>External façade (O)</td>
<td>Self-design façade (UPA)</td>
<td>Look nice (UPA)</td>
<td>enjoy beauty (HE)</td>
</tr>
<tr>
<td>7</td>
<td>Forecourt (A)</td>
<td></td>
<td>Façade finishes (O)</td>
<td>User preferred aesthetic (UPA)</td>
<td></td>
<td>Look different (SD)</td>
</tr>
</tbody>
</table>

In order to demonstrate the way in which PEC was achieved in the design of the five major spaces, each HVM was interpreted by identifying the patterns of linkages of the elements. However, it is not possible to discuss all the constructed HVM's within the confines of this article. It is sufficient to take the living room's HVM as an example to serve...
the purpose of this article. Figure 4 (HVM for the Living Room) shows that the space is linked to other attributes, categorized as decorative elements, furniture and abstract attributes. Categories of benefits (consequences) expected from these attributes include establishing user-preferred aesthetics, facilitating everyday and communal activities, creating a pleasant environment, and facilitating spatial improvement. Finally, the living room is linked to user values which include hedonism, self-image, family security, and conformity. These are the values that motivated the modification of the aforementioned attributes in order to create the expected environmental milieu, thus achieving PEC. Referring to figure 4, some of the elements (appear in small letters) contained in the aforementioned categories are derived from the raw ladders.

In order to explore the dominant perceptual orientation of the respondents, the HVM was divided into a number of different chains or segments. This technique was used to classify the respondents' behaviour towards their living environment. The results could also be useful in the designing of future housing units.

### Identifying User Perceptual Orientation in House Personalization

To identify the perceptual orientation of the respondents towards personalizing the living room being studied, four intra-chains were established and summarized from the HVM in Figure 4. These chains are:

i. Living room - hedonism and family security chain
ii. Living room - self-image chain
iii. Living room - tradition chain
iv. Living room - conformity chain

The first aspect to be identified is the strength of the chains by tabulating all elements included in each chain. An example of the calculation is shown in Table 2. The values in each cell are the number of relations between the respective elements, which appear to be both direct and indirect. The decimal point functions as a separator between the direct and indirect relations. The total value is the addition of the direct and indirect relations. For example, the total value of the living room's - Hedonism

![Figure 4. HVM for Living room. Source: Mohd Jusan (2007).](image-url)

Figure 4. HVM for Living room. Source: Mohd Jusan (2007).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>V</td>
<td>SI</td>
<td>EA</td>
<td>T</td>
<td>UPA</td>
<td>FF</td>
</tr>
<tr>
<td>Living Room</td>
<td>0</td>
<td>4</td>
<td>10</td>
<td>0.04</td>
<td>5</td>
<td>0.59</td>
</tr>
<tr>
<td>Abstract Attributes</td>
<td>0</td>
<td>0</td>
<td>3.61</td>
<td>7.05</td>
<td>0.0</td>
<td>7.11</td>
</tr>
<tr>
<td>SI Spatial Improvement</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9.09</td>
<td>0</td>
<td>4.40</td>
</tr>
<tr>
<td>EA Everyday Activities</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>UPA Pleasant Ambiance</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total values</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
and Family Security chain is 96.79 (96 is the total of the direct relation, and 79 is the total of the indirect relation).

Based on the calculation made on the total values of linkages of all the intra-chain pathways, the "living room – family security and hedonism" chain appears to be the strongest pathway (Table 3). This suggests that user values "hedonism" and "family security" are the major motivators in respect of the personalization of living rooms. They are followed by "conformity," "tradition" and "self-image" in the lower ranks respectively. The results suggest, therefore, that in the design process of a living room, addressing design expectations, which are determined by the values "family security" and "hedonism" should be regarded as the top priority. Elements within the chain help to suggest appropriate attributes for the design of a living room.

Therefore, the second aspect to be analyzed is the content of all the chains. Table 3 shows the contents of the living room intra-chains. Elements shown in parenthesis are derived from the HVM (Figure 3).

An interesting highlight from Table 3 is that the elements in Chain 1 do not suggest any physical dimension or any concrete attributes that can be directly manipulated in design process. What primarily concerned them was the renovation of the living room so that it would become a family space (abstract attribute). Although spatial improvement, which facilitates everyday activities and offers a pleasant ambience are the benefit derived from the renovation works, neither specific space dimension nor a tangible architectural component was included in the chain. It suggests that the choice of room sizes and those attributes required to fulfill family values family security and family hedonism have to be done by the user-clients themselves.

However, Chain 2 and 3 suggest that the living room is a space for guests and is meant to be used for communal activities, in which politeness, welcoming and honouring guests and showing respect for tradition are expressions of the user-values. Furniture is the most emphasized attributes for this chain. These attributes lead to "communal activity" that is dominated by activities such as entertaining guests and having communal gatherings. These two chains appear to suggest that for communal interaction, the living room must be designed in order to accommodate furniture, and become a multipurpose space.

Chain 4 reveals that the living room is a space where self-image is emphasized. It also suggests that in order to fulfill the standards set by the value of "self-image", users emphasize aesthetic elements, particularly decorative ceilings and wall...
finishes. All aesthetic elements were aimed at creating the "user-preferred aesthetic", which the respondents described as, "lively," "attractive," etc. By observing linkages between the "user-preferred aesthetic" to other elements in Figure 4, it is clear that this element is also linked to the issue of creating a "pleasant ambience" and, later, to "communal activities" and "everyday activities." This suggests that the aesthetic elements and user-preferred aesthetics are necessary in order to facilitate everyday and communal activities, and are determined by the values "family security", "hedonism", "conformity" and "tradition."

**Design Consideration for Achieving PEC**

Table 4 summarizes the above findings in terms of design suggestions for achieving PEC in a housing unit. Results for the other three major spaces are also included in the table. It provides useful information for housing designers in creating housing designs that encourage and support the involvement and participation of users in the design and personalization of their houses. Apart from highlighting the influencing values that determine the making of a home, the table also shows the functions, which are expected to take place in the available spaces, and the attributes tend to be emphasized by the users in order to personalize their houses.

An important point for highlight in the table is the contents of the row, "consideration for personalization", suggesting which attributes require decisions from the users. The table suggests that to achieve PEC in mass housing, a designer should be aware of the attributes likely to be modified in the future, and to consider an appropriate design that would ease modification of the attributes with minimum cost implication. As an example, in Malaysian terrace houses, the forecourt is the space in front of a house, which is normally open or semi covered, fenced and gated- the design of the gate and fencing should be decided by the users. It suggests, therefore that in mass housing schemes, the design of the gate and fencing should only be "semi-completed" in order to accommodate any possible future modifications which the actual users, themselves, might wish to carry out.

**CONCLUSION**

There are two important points which can be highlighted from the above discussion. Firstly, with regard to sustainable housing development at the micro scale level, the findings of the study suggest that user involvement in home making is essential...
in producing a living environment that is congruent with the users (PEC). This also implies that housing units in Malaysian mass housing schemes developed through the current mode of housing delivery must be designed and constructed in flexible way in order to accommodate possible future modification and personalization.

Secondly, the MEC research model has the ability of associating housing unit attributes to human motivational factor (user-values). A significant benefit, therefore, from the application of this research model is in facilitating housing unit design by providing data on house attributes relevant to the user's expectations, which ultimately results in achieving the goal of PEC. This data can also be useful in the design manipulation of flexible houses that are able to accommodate future modification. This is a new area in which the MEC research model is able to contribute to the development of sustainable housing.

However, in order to be more effective, some of the shortcomings of the methods applied in this study need to be addressed. The author found that certain emphasized attributes were not reflected in the physical modification made on the renovated houses. For example, although living rooms were emphasized by all respondents, the physical enlargement of the space was not apparent due to building set-back limitation. To overcome this shortcoming, physical models simulating certain house design could be used instead of renovated houses in order to elicit the design preferences of users. By using this technique, respondents can be asked to modify the house model according to their wishes without the physical limitation. In this way, such data as desired or anticipated room sizes could be expressed by the respondent. Also, in this study, the analysis of the data was performed manually using the traditional methods. The process was time consuming and laborious. For a large-scale study, this method and process could prove to be extremely difficult and uneconomical. Also, data should be elicited from a cross-section of generation (parents, children, grandparents, etc) in order to ensure that the design expectations of each family member are represented. Further research would be necessary in establishing appropriate MEC research methods and their implementation, which could accommodate large scale housing research, which would represent each generation in all the households.

REFERENCES


MOHD JUSAN, M (2010). Renovation for Personalization: A Development Arm for Sustainable Housing. UTM Press, Johor Bahru, Malaysia


Mahmud Bin Mohd Jusan

Author’s Address:
Mahmud Bin Mohd Jusan
Department of Architecture
Faculty of Built Environment
Universiti Teknologi Malaysia
81310 UTM Skudai
Johor, Malaysia
b-mahmud@utm.my
mjusan@yahoo.co.uk


INTER-DISCIPLINARITY IN URBAN DESIGN: Erasing Boundaries between Architects and Planners in Urban Design Studios

Sujata Shetty & Andreas Luescher

Abstract
Urban design has historically occupied the gap between architecture and planning. Although there have long been calls for the discipline to bridge this gap, urban design has continued to lean more heavily on design than planning. The efforts to revitalize downtown Toledo, a mid-western U.S. town experiencing steep economic decline, present a classic example of the potentially unfortunate results of this approach. Over the past three decades, there have been many attempts to revitalize the city, especially its downtown, by constructing several large public buildings, all within a few blocks of each other, all designed with little attention to each other or to the surrounding public spaces, and with a remarkable lack of civic engagement.

Responding to calls in the literature for inter-disciplinarity in urban design, and to the city’s experience with urban design, the authors created a collaborative studio for architects and planners from two neighboring universities with two purposes: first, to establish a collaborative work environment where any design interventions would be firmly rooted in the planning context (i.e., to erase boundaries between architects and planners); second, to draw lessons from this experience for the practice and teaching of urban design.

Despite the difficulties of collaborating, architects and planners benefited from exposure to each other, learning about each other’s work, as well as learning to collaborate. The interdisciplinary teams developed richer proposals than the architect-only teams. Finally, critical engagement with the community is essential to shaping downtown development.

Keywords: Urban Design, Collaborative Studio, Architecture and Planning, Community Engagement.

INTRODUCTION

Scholars agree that urban design, interdisciplinary at its core, has roots in both architecture and urban planning (Krankel McCullough 2008, Inam 2002, Sert 1956). However, despite efforts to synthesize architecture, planning and landscape planning to solve mid-twentieth century problems of declining cities and urban sprawl, urban design has largely been the province of ‘urban-minded architects’ (Krieger 2009). The practice of urban design is often described as architecture at a large scale (Inam 2002, Krankel McCullough 2008, Marshall 2009), with too much emphasis on “design” and not enough on “urban” (Inam 2002). Recently, for example, ‘star’ architects have increasingly been working internationally as megascale planners (Ockman 2008).

Even in small towns without star-architect projects, urban design has become increasingly design-oriented, paying limited attention to the planning context or to engaging members of the community. The efforts to revitalize downtown Toledo, a mid-western U.S. town experiencing steep economic decline, present a classic example of the potentially unfortunate results of this approach.

The urban design literature has often called for greater collaboration between architecture and planning and greater community engagement (Krieger and Saunders 2009, Scott Brown 2009, Chase, Crawford and Kaliski, 2008). For example, Krieger (Krieger 2009: xii) argues that “Urban designers must learn to be more effective collaborators, willing participants in true inter-disciplinary endeavors…. Such skills are not always available in a designer’s tool kit." Students of urban design need to learn collaborative skills, but there is limited empirical research to show how they might be taught or what the benefits and challenges of such an endeavor might be.

In critically evaluating an urban design studio that emphasized architect/planner collaboration...
and community engagement, we contribute to this gap in the literature. Drawing on design studio traditions and community-based urban planning courses, we (an architect and a planner) brought together students from two disciplines and two universities, to work in inter-disciplinary teams on the public areas surrounding a proposed downtown arena.

Our goals for the course were to provide a service to the city and to allow students to collaborate with colleagues from another discipline. We also had research goals: to respond to the call for the practice of urban design to engage both planners and architects, to model this collaboration in a microcosm, and to draw lessons for teaching and practice. We had two research questions. First, what if anything did the architects and planners learn from their collaboration? Second, did collaborating influence their projects, and if so, how?

The course had a control group (architect-only teams) and an experimental group (architect-planner teams). We administered pre- and post-course surveys with open-ended questions to all the students; we received feedback from both groups of students in joint and separate meetings; we administered course evaluations to all students at the end of the semester; we conducted in-depth interviews with some students.

Students reported learning to work in teams, improving their communication skills, and learning a lot about the ‘other’ discipline’s work culture and approach to urban design. While collaboration was often a struggle, it greatly enhanced the breadth of issues that students considered, leading to richer proposals. These findings are limited to this case study and therefore represent just one contribution to enhancing understanding of the teaching and practice of urban design as an inter-disciplinary endeavor.

The first section of this article reviews the literature on the relationship between planning and architecture in urban design and the calls for wider engagement including inter-disciplinary collaboration in teaching and practicing urban design. While collaboration was often a struggle, it greatly enhanced the breadth of issues that students considered, leading to richer proposals. These findings are limited to this case study and therefore represent just one contribution to enhancing understanding of the teaching and practice of urban design as an inter-disciplinary endeavor.

The first section of this article reviews the literature on the relationship between planning and architecture in urban design and the calls for wider engagement including inter-disciplinary collaboration in teaching and practicing urban design. The second introduces the City of Toledo, showing its lack of attention to planning in urban design projects. The third describes and evaluates the interdisciplinary studio experience. The final section discusses lessons learned for teaching and practice.

ERASING BOUNDARIES

Urban design at the confluence of architecture and planning

Urban design has been at the confluence of architecture and planning for roughly fifty years. At the 1956 conference in urban design at the Harvard Graduate School of Design (GSD), José Luis Sert argued that urban design was the part of planning concerned with the physical form of the city (Krieger 2002). Many authors have continued discussing the overlap between architecture and planning in urban design, including Vernez-Moulden (2002), Inam (2002) and Krieger (2002).

This overlap highlights urban design’s indistinct boundaries and its struggle for definition (Krankel McCullough 2008, Krieger 2009). Exploring the spatial and conceptual arenas across which urban designers work, Krieger (Krieger 2002) suggested that rather than boundaries, there were eight territories or spheres of action for urban design. He began with the definition of urban design offered by Sert at the 1956 GSD conference: “urban design occupies a hypothetical intersection between planning and architecture, and … fills a perceived gap between the two” (Krieger 2002: 34). The first of Krieger’s eight ‘territories of urban design’ was the bridge between planning and architecture: “The most frequently offered response to what urban designers do is they mediate between plans and projects. They somehow translate the objectives of planning regarding space, settlement and allocation of public resources, into strategies to guide the work of architects, developers and other builders of cities… Urban designers must visualize - and make others see - the desired effects of planning” (Krieger 2002: 34).

Despite their commonalities, architecture and planning have diverged as they have matured. They have formed different cultures (Wyatt 2004) and distinct disciplinary enclaves (Marshall 2009), leading some to argue that urban design has “gained autonomy from its progenitor design and planning disciplines” (Krieger 2009: vii).

Still, urban design has largely been the province of architects (Inam 2002, Krieger 2009). Urban design as practiced now has been described as large-scale architecture in an urban context (Inam 2002, Krankel McCullough 2008), as an

---

1 This was the conference at which urban design as a discipline got a formal start in the United States.
"extension of architecture, not something inherently different" (Marshall 2009: 53). With the reduced power of planning in U.S. city governments and reduced support for social planning, urban design in cities has been ceded to designers. Some of the largest urban design projects in the U.S. and in the world are being led by architects (Ouroussoff 2009).

The Call for Wider Engagement
Even as scholars grapple with urban design’s evolving role, there have been calls for practice and teaching to cross boundaries, engaging multiple disciplines and stakeholders. Kelbaugh and Krankel McCullough (2008) suggest that the focus on the individual building and the underdeveloped urban design sensibility in schools and practice has too often led to buildings that do not engage their urban setting. Even when architects were trained in planning, their exposure to urban planning was thin and "not well integrated with their architectural identities….. And it got worse, as planning departments lost their social thinkers and activists, and architects lost interest in social problems. So eventually, most urban designers had training that was primarily in architecture…."(Scott Brown 2009: 82).

In the introduction to their book on design studio pedagogy, Salama and Wilkinson(2007:5) assert that despite continuous attempts to modify practices and content, "consensus is lacking on what changes will best meet the needs of the design professions while supporting the aspirations of contemporary society." Our challenge in teaching an urban design studio was to bridge the distinction between architecture and planning in an academic setting. Noting that the scientific model grows ever more influential in the university setting, Vernez-Mouldon asks, "What does this imply for education, knowledge and theory building in urban design? In practical terms, urban design can be considered as a specialty of professional programs in architecture or planning; or given its integrative basis, it can be an arena of leadership for urban planning, design and development" (Vernez-Mouldon 2002: 53). Consistent with Vernez-Mouldon’s view of the field’s integrative nature, we structured our studio to emphasize collaboration and incorporate elements of traditional architectural design studios and community-based urban planning courses.

The call for wider engagement has been interpreted in other ways as well. Some argue that engaging the urban setting means taking a broader view of the scale and role of urban design - working at scales from the street corner to the region and beyond (Scott Brown 2009). This broader view requires collaboration beyond professional boundaries (Krankel McCullough 2008, Krieger 2009). Another view of engaging the urban calls for urban designers to recognize the multiple interests and decision-makers at work in cities and engage members of the community much more broadly (Scott Brown 2009, Greenberg 2009, Krieger 2009, Kaliski 2008, Sanoff 2007). We explore these themes further in the rest of the paper.

BACKGROUND ON THE CITY OF TOLEDO

All design, no research
Toledo, with a population of around 300,000, was once a flourishing manufacturing center but is now declining along with the manufacturing sector of the entire region. It has been ‘revitalizing’ its downtown for the past twenty-five years, constructing a convention center (1982), a government center (1983), a baseball park (2002) and now a proposed multi-purpose arena (which opened in late 2009), all within a few blocks of each other (see Figures 1 and 2).

The impetus for these developments came from the county government, which made its case primarily on grounds of economic development. Little attention was paid to the planning and design consequences of the large physical changes. The city employed the consulting firm Conventions, Sports and Leisure International (CS&L), which does not (judging from the firm’s website) appear to employ architects or planners. According to the report by the County Board of Commissioners in the Lucas County Action Plan (Lucas County Arena Action Plan 2006), the following criteria were used, along with CS&L’s report, in determining the best site for the arena: "1. Was there sufficient parking within a six block walk of the site? 2. Could the site be physically linked to the Convention Centre? 3. Was the site large enough for the construction of an arena?"

These criteria seem rather simplistic. Neither the city nor the county commissioners studied or
mapped available data, nor did they ask consultants to do so. The arena seems to have been planned with very little prior research, and the small amount of research conducted was limited largely to the economics of building an arena in the city. Limiting the analysis of possible sites to the three criteria mentioned above made the chosen site nearly a foregone conclusion. Although it is close to other downtown landmarks, the site presents many problems, as it covers a four-block swath and closes off a major downtown street.

Concerned that the arena was being built with limited attention to its surroundings, the Toledo Design Center, a local non-profit, called for urban design proposals for the 'public realm' surrounding the new arena. The Design Center was looking for fresh ideas to present to the public and the city's leadership; we designed our studio to respond to that call.

THE CASE STUDY

A studio modeling inter-disciplinarity

A seminar in urban design offered to students of geography and planning at the University of Toledo, and an urban design studio offered to students of architecture at Bowling Green State University, 20 miles away, seemed like possible settings in which to explore these ideas. Construction had just begun on the $80 million multipurpose arena, and this project presented many challenges for students to tackle.

This opportunity coincided with our interest in finding more relevant ways to 'teach' urban design: methods including research, student teams, community clients, critical reflection (Kim 2006), and inter-disciplinary collaboration.

The mission of the collaboration was to think through the idea of the public realm and develop proposals for it. As our studio assignment said, "The proposed new multipurpose arena provides an opportunity to reshape our downtown and riverfront and be the foundation for the area's revitalization. In light of this, the mission of this studio is to provide a vision for the public realm surrounding the proposed arena, and by extension, a vision for the city." Each team was assigned a part of downtown close to the proposed arena and charged with developing proposals for the public spaces historically ignored by designs for the various large building projects downtown. Students were given a fairly free hand as long as teams could justify their proposals.

Both instructors agreed that the class should not focus on brilliant "sketch-on-the-napkin" design proposals. Rather, it should expose students to inter-disciplinary approaches to evaluating problems, to the design and planning opportunities in the public realm presented by the investment in the new arena, and to working with members of the community through the Design Center. We explained that the desired outcomes for this class differed from those of standard studio projects: a good urban design concept for downtown was not the only object of the exercise; the goal was also to collaborate with and learn from others.

Architecture and planning students worked separately for the first few weeks. The architecture students began the semester by researching Edmund Bacon's work on the design of cities (Bacon 1974), especially his concept of the biological paradigm - the idea of the city as organic and the notion that architecture and planning go hand in hand (Heller 2009, Knowles 2009). They also studied the Gallery at Market East in Philadelphia, built in an area that was considered a no-man's land for commercial development, and which reflected Bacon's ideas about cities.

Planning students received a brief introduction to urban design, which included materials the architecture students were studying. Like their colleagues in architecture, they began with studying patterns of urban form (Bacon 1974), to give them an understanding of the physical structure of cities. They also read classic pieces by Allan Jacobs, Kevin Lynch, Roger Trancik and Jane Jacobs, among others, to help them look at cities through a different lens. So, for example, they learned about 'reading the city', and that "conscious, careful, purposeful looking, accompanied by continuous questioning of the meanings of what one sees, can tell a lot about a city or a neighborhood" (Jacobs 1985: 6). They began to think about the elements that make

2 The last large public investment downtown, the baseball park built in 2002, is in virtually the same location as the city's first professional baseball stadium, built in 1883. This appears to be a happy accident rather than the result of any grand plan.

3 The University of Toledo offers a program in planning but not in architecture; Bowling Green State University offers a program in architecture but not in planning. Both offer classes in urban design under the auspices of their respective programs.
a city more legible (Lynch 1960). They learned about figure ground theory (the relationship between solid and void that creates urban fabric), linkage theory (lines such as streets or linear open spaces that connect one environment in a city to another), place theory (the natural, social or cultural context - how people perceive a place) and the need to think about these appropriately and collectively in the process of urban design (Trancik 1986). Jane Jacobs (1961) provided a take on social life in cities, and the power planners and designers have over the death and life of urban spaces. These and other classic works introduced the planning students to some of the ideas and vocabulary used by architects and urban designers.

Based on this and other work, the planners began to develop an urban design vocabulary. They applied this in an exercise in which they analyzed an urban space using concepts gleaned from these authors. We deliberately avoided teaching exactly the same topics, but we did expose each group to critical materials from the other discipline to provide a meeting ground for students with different backgrounds and knowledge.

To help us decide how to group the architecture and planning students, we conducted a simple survey that allowed us to organize the teams to reflect a range of backgrounds and experience. In the end, we had six teams with architects and planners and five teams with only architects. Teams determined their own processes for exchanging ideas and reaching decisions.

The Studio
In the weeks leading up to the collaborative studio, a team of planning students researched the recorded planning history of the city (particularly plans for downtown), analyzed census data for the metropolitan area and mapped the information, giving all students a deeper understanding of the region. Another team looked at land use, zoning and other planning information for the downtown area. Three teams did case studies of arenas built in other cities to understand how well they worked in terms of design and planning, and what lessons they might hold for our city. The planning students presented their work to the entire group.

The contribution of the planning students, therefore, was to describe more fully the environment in which the arena was being built. The study of the local context meant that the downtown was no longer just a clash of grids or a parade of architectural styles, but an urban center in a declining economy, surrounded by a diverse population, facing issues of vacancy, abandonment, and suburban flight. At the same time, a core of businesses, housing and investments showed signs of a possible change in the fortunes of downtown. Students also uncovered the stories of many of the historically important buildings, including some of which had been demolished.

The architecture students created figure ground drawings (see Figures 1 and 2) and built a scale model of downtown, allowing a deeper
understanding of the physical fabric of downtown. Students saw the long-lost connection to the river, as well as the voids caused by demolition and were shocked to realize that only one downtown intersection still had buildings standing on all four corners.

Students made regular presentations of their work in class. The studio concluded with a well-attended public presentation at the downtown convention center.

Evaluating the Benefits of Engagement and Collaboration for the Transformation of the Built Form
While this collaboration between architects and planners lends itself to examination on many different fronts, we limit ourselves here to the research questions we posed earlier:

first, what, if anything, did the architects and planners learn from each other and from the collaboration; and second, did collaborating influence their projects, and if so, how? The answers to these two questions are intertwined: as the architects and planners learned from each other, their collaboration changed the projects. Findings on both research questions are presented in the following four sections.

Designing in a Planning Context; Planning for Design
For the architects, the physical manifestation of the public realm was central. As Figures 1 and 2 illustrate, the city’s downtown has a lot of open space, and the architects began almost immediately to
design large buildings to fill it, thus defining paths, edges or nodes to create well-defined open spaces. The planners’ sense of the public realm was more rooted in their initial studies of downtown. They wanted to know first who would use these public spaces, what uses these new buildings would house, and who would use thousands of square feet of new development in a downtown with a declining population. They were concerned about circulation within downtown, the effects on existing retail, and accessibility to all the residents of the city and the metropolitan area. They seemed less interested in the physical definition of space.

The architects’ initial focus on the physical and the planners’ initial focus on context were consistent across all architect-planner groups. Yet as the collaboration continued, the architects moderated their initial focus on designing buildings to define a vision for the city. Meanwhile, the planners gradually came to understand the power of design and how design can contribute to a vision for the city.

The difference between an architect-only team and an architect-planner team is instructive here. For the typical architect-only team, the assessment was purely physical, as this example illustrates: "site defined by a glass concrete building with weak façade; a tall white skyscraper with a strong hold of the corner; a large residential apartment complex with a glass window façade."

Similarly, their design concept was based in the physical and made little reference to the larger city:
“a canopy design of rectangular glass panels; a restaurant to complete the canopy and activate the street; a corner residential complex to complement the public realm design.”

In contrast, the typical architect-planner teams, after some struggling, saw the sites in a wider context. For example, one such team, in assessing their site, conducted a series of analyses that went well beyond the confines of the site itself, extending their reach to downtown and the rest of the city. They found a surfeit of downtown surface parking (Figure 3) and a deficit of small, usable green spaces (Figure 4). An analysis of traffic flow (Figure 5) including traffic counts showed a downtown easily accessible to car-owners, but though close to public transportation lines, less convenient for users of public transportation. Only then did they look at the purely physical aspects of the site, in relation to the rest of downtown and the city, particularly its location at the intersection of various grids that reflect stages of the city’s growth (Figure 6). Their design concept embraced far more than the physical and consisted of four principles: building for future prosperity, enhancing the legibility of the city; providing equitable accessibility; and serving as a gateway to downtown.

Students were aware that collaboration had changed their project. One architecture student said, “By far the best part of this studio was that instead of just concentrating on building and structure we were forced to analyze the community as a whole,” while another said, “[I liked] learning about the different aspects of the urban fabric in Toledo. I liked that we focused on the site more than just the building.” Similarly, planning students appreciated what they learned from the architects, saying, “[I liked] learning the architecture process and how architects think and get ideas. I liked designing something that actually matters.”

The Landmark Structure vs. Incremental Change
The architects were nervous about presenting proposals without large landmark buildings. They believed their role was to create a bold vision for the city, as reflected in new buildings. In contrast, the planners were relatively incremental in their approach, preferring to fill existing voids with small buildings and initially concerning themselves more with access and use than with the physical quality of space. An example is illustrated in Figures 7-10.

To address these differences, we facilitated much group discussion, assured the architects that a proposal without a dramatic new building would not be summarily dismissed, and reminded the planners that the physical quality of the public space mattered. As a result, students began to feel greater freedom to collaborate with their peers. For example, one architect-planner team found that its site had been home to the Paramount Theater, once one of the city’s cultural jewels. The theater had been demolished in 1965, making way for a surface parking lot. After initially proposing a large multi-story, multi-use building as a way to define the corner of an intersection, the proposal evolved into a much smaller scale, including an outdoor theater that recalled the site’s history and a series of small mixed-use buildings. Landscaping, rather than a huge new building, now defined the corners (see in Figures 8 and 10).

Broadening the Scope of Urban Design and Engaging the Community
Local architects and planners associated with the Toledo Design Center helped introduce the students to the project and were available for consultation throughout the collaboration. Students also spoke to downtown residents, business owners and other stakeholders who, they were surprised to learn, had not been engaged in the actual arena project. It became clear to the students that the arena was primarily about economic development, and secondarily about designing the building. The proposal was solely for the building site, with no references to the public spaces around it or to the rest of downtown.

To the planners, schooled in an approach emphasizing communication and collaboration (Healey 1997, 2003, Innes, 1996, Forrester 1999, Hoch 1994, 2007), this was a serious shortcoming. Although the studio did not require students to talk to community members, planning students spoke to city planners as they collected data, and spoke to local storeowners and residents informally. Thus the planner-architect groups had a better sense of, say, the history of their sites, or peoples’ visions for the area. One architect-planner group, in response to what they heard from residents, proposed small, defined green spaces, and relocated a bus transfer station to this site to make downtown more accessible to all, especially those without access to cars (see Figure 11).

In contrast, the architect-only teams offered
proposals based on their vision for the city. One such team, using a definition of public realm consisting of "axis-grids-connectivity," also used the intersecting grids to guide their proposal, but they envisioned massive buildings defining the edges of a large green space, paying little attention to the question of who would use the buildings (see Figure 12).

The Challenges of Communicating Across Disciplines

Although students came to the course knowing that collaboration was essential, they came with different experiences. For the architects, used to working solo, this was a first attempt at working collaboratively on a design project. The planners had worked in teams on class projects but had never collaborated across disciplines. Both sets of students (including those in architect-only teams) reported that this studio was helpful in developing their ability to communicate and work in teams.

However, the mixed teams also suggested that working across disciplines was particularly challenging. The architects often felt constrained in their visions by the planning students, who suggested that the region's demographic profile did not show a big enough market for thousands of square feet of downtown loft apartments or high-end retail. The planners were hesitant to draw or sketch, often preferring to make design suggestions verbally. They also lacked confidence when suggesting design ideas and felt that their ideas were often dismissed too quickly. But over the course of their work together, students were forced to find ways to communicate, and their proposals reflected their discussions. For example, since the city was once home to a thriving glass industry, one planning student suggested a glass tower to draw attention to the city's industrial history. To his architecture teammates, this was too literal a reference. The compromise was to explore the use of glass as a material in any proposed structures, and the final proposal included a glass cube as a piece of public art.

THE LESSONS

Our studio responded to calls to make the practice and teaching of urban design more collaborative and inter-disciplinary. It was located in a city where, despite many attempts to revitalize downtown, lack of collaboration between architects and planners and lack of community engagement have resulted in piece-meal projects with limited impact; thus, we also hoped the studio would show the city the possible benefits of engagement and collaboration.

In practicing the principles of collaboration and engagement, both the architecture and planning students were stretched beyond the usual boundaries of their fields. They each gained an appreciation for the ‘other’ discipline. In thinking about the public realm, the planners concentrated on context first and tended towards incremental changes. In contrast, the architects started with the physical design of these public spaces, proposing large, dramatic buildings as a way to define these spaces. The architects also tended to begin with...
their vision—a physical design—for the public realm. Planners, however, talked to stakeholders to arrive at a vision that had community input—the physical design was then a part of a larger vision. These differences led to some bumpy collaborations, but the inter-disciplinary proposals were richer as a result.

By presenting conceptual designs grounded in the planning context, the projects sparked discussion about the public realm. Following the public presentation of the students’ work, the Toledo Design Center conducted a series of interviews with downtown residents and businesses to get their views on how to plan and design areas around the new arena (Toledo Design Center 2008), eventually submitting a policy document to the city. This momentum seems likely to continue, thanks to the efforts of residents and leaders interested in their city’s future.

After reflecting on our experience, we make three recommendations. First, we suggest more interdisciplinary studios and studio assignments. Urban design remains a pedagogical process with roots in architecture (Inam 2002), but there are calls for change (Inam 2002, Krankel McCullough 2008, Krieger 2009). Scott Brown suggests that practitioners of urban design “should acquire from their education a greater sophistication about urban life than they usually have and more philosophies than are written in architecture” (Scott Brown 2009: 78). Having students work collaboratively across disciplines could address this. Similarly, Toledo would do well to integrate a broader understanding of planning when designing any large new buildings.

Second, we suggest offering studio assignments rooted in a community context— not just working with an actual site, but engaging political, social and economic factors in the urban design process. Urban design, like planning, functions in an arena where existing power structures and the politics of decision-making shape practice (Krankel McCullough 2008), yet urban designers have been naïve about these forces (Inam 2002). Introducing students early to the many facets of working in an urban context can only enhance their education. At the same time, urban design studios offer cities a range of options, rather than a single design ideology (Kaliski 2008), which helps communities think through their visions for their city and make intelligent urban design choices.

Third, where possible, we suggest broadening participation to include other disciplines engaged with urban issues. A good starting point would be to include landscape architecture, which has historically been linked to urban design (Krieger 2002), not only in the studio, but also in cities such as Toledo, where vacant land is plentiful.

Finally, we suggest further empirical research on urban design practice and pedagogy that incorporates collaboration and community engagement in different ways. Understanding the processes by which this occurs and applying the lessons learned can help make urban design more relevant to communities while simultaneously strengthening the discipline.

REFERENCES


GREENBERG, K. 2009, A third way for urban design, Urban Design, University of Minnesota Press, Minneapolis, USA and London, UK.


KAUSKI, J. 2008, Everyday urban design: Towards default urbanism and/or urbanism by design, Writing Urbanism, Routledge, New York, USA.


LYNCH, K. 1960, The Image of the City, Joint Center for Urban Studies, Cambridge, USA.


ACKNOWLEDGEMENTS

We thank the editor and the anonymous referees for their thoughtful comments. We also thank our colleague Scot MacPherson for his collaborative and scholarship engagement with us. Above all, we thank our students for their hard work and openness for inter-disciplinary teaching.

Authors’ Addresses:
Sujata Shetty
Department of Geography and Planning
University of Toledo
2801 West Bancroft Street
Toledo, OH 43460
sujata.shetty@utoledo.edu

Andreas Luescher
Architecture and Environmental Design
College of Technology
Bowling Green State University
Bowling Green, OH 43403-0301
aluesch@bgsu.edu

97
SMART HOMES & USER VALUES
Edited by Ulf Keijer and Greger Sandström
Royal Institute of Technology
School of Architecture and the Built Environment.
Stockholm, Sweden.

This book discourses upon Smart homes and User values. Its aim is to contribute to bridging the gap between technology and user values in the home setting. Most smart home projects address technology development, albeit often with some application of the technology in mind. In the book the other view is taken, starting with the users’ experiences and bringing it back to technology, organisation and service delivery. Evaluations of smart homes in use are presented. User perspectives on, i.e. ordinary residential living, assistive living and digital services are covered. Presented results indicate how society, the real estate industry and the individual residents may benefit; and the prerequisites for it. The book contains evaluations of smart homes in Europe, Asia and North America. The book constitutes the state-of-the-art in the field, indispensable for the construction and the real estate industry, developers of the systems and technology, other professionals in the field, institutions, students and everyone interested in new technology for homes and everyday life.

Go to www.openhouse-int.com for a free read of a chapter and PayPal order details.
DESIGN STUDIO PEDAGOGY: Horizons for the Future
Ashraf M. Salama & Nicholas Wilkinson (editors).

This groundbreaking book is a new comprehensive round of debate developed in response to the lack of research on design pedagogy. It provides thoughts, ideas, and experiments of design educators of different generations, different academic backgrounds, who are teaching and conducting research in different cultural contexts. It probes future universal visions within which the needs of future shapers of the built environment can be conceptualized and the design pedagogy that satisfies those needs can be debated.

Addressing academics, practitioners, graduate students, and those who make decisions about the educational system over twenty contributors remarkably introduce analytical reflections on their positions and experience. Two invited contributions of N. John Habraken and Henry Sanoff offer visionary thoughts on their outstanding experience in design pedagogy and research.

Structured in five chapters, this book introduces theoretical perspectives on design pedagogy and outlines a number of thematic issues that pertain to critical thinking and decision making; cognitive and teaching/learning styles; community, place, and service learning; and the application of digital technologies in studio teaching practices, all articulated in a conscious endeavor toward the betterment of the built environment.

Contributing Authors:

From:
Australia, Canada, Egypt, Finland, Israel, Italy, Kingdom of Saudi Arabia, Kuwait, Qatar, Serbia and Montenegro, The Netherlands, Turkey, United Arab Emirates, United Kingdom, United States of America.

ORDER FORM
Quantity @ 29.95 GBP or 45 Euros or 58 US$ Total: Cost: 

Alternatively pay by direct telegraphic transfer to:
Urban International Press,
HSBC Plc., 110 Grey Street, NEWCASTLE UPON TYNE, NE1 6JG,
United Kingdom.

IBAN GBP: GB53MIDL 4034 1891 386429 SWIFT/BIC: MIDL GB 2108 J
IBAN US$: GB45MIDL 4055 1539 0727 12 SWIFT/BIC: MIDL GB 22

For an invoice ask at: carol.nicholson@rbenterprises.com or Pay Pal facility at: www.openhouse-int.com

Please send cheque drawn on a UK bank, payable to: Urban International Press, P.O. Box 47, Gateshead, Tyne & Wear NE9 5UZ, United Kingdom.

OPEN HOUSE INTERNATIONAL SUBSCRIBERS 30% discount
ORDER FORM

Quantity

---------------- @ 19.85 GBP ----------------- or 20 Euros

Total Cost: -----------------------------

Alternatively pay by direct telegraphic transfer to:
Urban International Press, HSBC Plc, 110 Grey Street, NEWCASTLE UPON TYNE, NE1 6JG, United Kingdom.

IBAN GBP: GB53MIDL 4034 1891 385429
SWIFT/BIC: MIDL GB 2108 J

IBAN US$: GB45 MIDL 4005 1539 0727 12
SWIFT/BIC: MIDL GB 22

For an invoice ask at:
openh@hotmail.co.uk or
Pay Pal facility at: www.openhouse-int.com

Please send cheque drawn on a UK bank payable to: Urban International Press, PO Box 47, Gateshead, Tyne & Wear NE9 5UZ, United Kingdom.

OPEN HOUSE INTERNATIONAL SUBSCRIBERS
30% discount