Design Morphology Group
Roel Daru, Senior Lecturer, Design Morphology
Eindhoven University of Technology
Faculty of Building and Architecture
Department of Architecture and Urban Planning

1. OBJECTIVES

- SCIENTIFIC: better understanding of the generation of built forms, their description, evolution, intentional and esthetic expression and experience, meaning and use,
- PRACTICAL: the development of tools for the generation of built forms and the heuristics for obtaining them.

2. INTERESTS

- Working more on the side of the production of forms than their reception, but with a definite interest in both,
- enhancing an explorative approach but making use of strict research methods, without losing sight of the hermeneutic tradition,
- redirecting efforts onto the pluralistic styles of designing as an alternative to pursuing an unifying model of the design process,
- developing and testing specific simple, focused and if possible generic tools adaptable to various design situations and modelling them to specific personal working styles, as an alternative to technologically ‘heavy’ tools.

3. ACTIVITIES

(Development of the field as reflected in the activities of the group)

PAST (1): form perception (geometric and arithmetic proportions)
PAST (2): form description and (re)presentation
  - Symbolic (morphographic and morphometric descriptions).
  - Analogic (spatial and stylistic conformations).
  - Iconic (geometric and genetic descriptions).
PRESENT: form reception and generation
- Reception (analogic form and pattern recognition).
- Generion (styles of designing and 2D form generation in the sketch design phase, based on the symbolic, analogic and iconic principles of form description and (re)presentation).

FUTURE: form generation, reception and logics of prescriptive rules
- Generation (personality dependant tactics of designing and 3D form generation in the sketch design phase, also for group processes).
- Reception (analogic and iconic form and pattern recognition).
- Logics (non monotonic design thinking: abduction and adduction)

4. ISSUES
- Which aspects of the design process should be supported to stimulate effective design of high quality buildings?
- Is designing the same activity across all domains of designing? (architecture, industrial design, mechanical engineering, graphics, etc.)
- Are design tools developed for one domain transferable to another?
- Are design tools adaptable to the individual personality, heuristics and working styles of designers?
- Is canned, pre-packaged design knowledge useful during the early phases of the design process or rather in other phases (i.e. evaluation)?
- What is design knowledge? (information, heuristics, attitudes, experience, imagery, etc.)
- Can we develop design tools which inspire designers enough to apply them in daily practice? Can certain design tools hamper the creativity of the designer?
- What is so special about using computers in the design process?
- Was Marshall MacLuhan right after all (the medium is the message/message)?
- In the past decade, the end-users of buildings has been forgotten in favour of the expression of the designers’ views translated in bold forms, isn’t it time to get them back into focus?
- How can the designed characteristics be made measurable as a basis for objective comparison?
Figure 1: Research Approach of the Design Morphology Group

- **RESEARCH APPROACH**
- **CASE STUDIES**
- **IMPLEMENTATION**
- **BASIC RESEARCH**
- **TOOLS IMPLEMENTATION**
- **TOOLS APPLICATION**

Figure 2: Criteria for Design Support Tools

1. **RELIABLE**: doing what it claims to do
2. **PRODUCTIVE**: generates more elaborated analyses, evaluations and/or design proposals, than without the tool
3. **VALID**: delivers intended design product in design office reality
4. **ADEQUATE**: design style compatible
5. STAFF

- Professor of Visual Arts and Architecture: Jean Leering
- Senior Lecturer Design Morphology: Roel Daru
- Lecturer Design Morphology: Tom Dubbelman
- Technical staff member: Ton de Caluwe
- PhD candidates and post-graduates (see research projects)

6. INTERDISCIPLINARY COLLABORATION

Many of the projects named hereafter have been the result of interdisciplinary collaboration, combining design background, psychological and computational knowledge within and without our institution, in particular with the universities of Delft, Nijmegen and Tilburg. Tools have been tested and assessed in practice.

7. TYPICAL PhD RESEARCH PROJECTS

(Published by ‘Bouwstenen’: the scientific press of the faculty)

Wim Adams, 1991: ‘Supporting Decision Making Processes, a graphical and interactive analysis of multivariate data’ (about datagraphics and the perception of proportions; the perception of the plastic-number series of Dom van der Laan empirically supported)

Anton van Bakel, 1995: ‘Styles of Architectural Designing’ (about identifying and assessing personal preferences in architectural working and product styles for didactical design management)

Martin Veenendaal, 1996: ‘Datagraphical Heuristics’ (as a logical follow-up of Wim Adams’ research, is about the cognitive underpinning of the perceptual and predominantly heuristic aspects of pattern forming and recognition)

Philip Snijder, 1998: ‘Sketcher’ (about probing the support of conceptualisation by very fast automatic, but constrained sketching and exploration of the results by the designer, employing evolutionary programming techniques)

(P.M.) Piet Venemans, 1997: ‘Prevention of Desorientation by Architectural Design’ (about the influence of geometric and topological spatial structure for way finding and how this knowledge can applied in the design process).
8. TYPICAL POST GRADUATE RESEARCH PROJECTS

(Published by TUE IVO: Institute for Continuing Education)
Hugo de Haan, 1992: ‘Electronic Sketching in the Design Process’
Phil Winteraeken-Bruls, 1992: ‘RAP, GIOS and ROP in the Housing Process of the
Governmental Building Agency’
Jianping Li, 1993: ‘ROP and SPACE, comparison of the building layout programs with
two case studies in architectural design’
Cristian Popescu, 1993: ‘The Usability of ROP to Support Facility Space Planning’


Adams, W. and R. Daru (1994). Matchmaker, an instrument to match demand and
supply of buildings and revealing discrepancies. Paper, 2nd Design and Decision
Adams, W. and S. van Kol (1991). Gebouw-indelingen met behulp van MiniCad+. VCA-
Mededelingen, 8: 20-22.
Bakel, A.P.M. van (1991). Stylistic Description Instead of Methodological Presentation
Information Technology Conference on Advances & Development in Information
Automation, Singapore: Institution of Engineers, 9-17.
and Decision Support Systems in Architecture and Urban Planning, Mierlo-Hout
Bakel, A.P.M. van (1993). A Creativity Supporting Data Bank. In: Patrick Holligan,
Proceedings of Proceedings of the 1st International Conference on Creativity and
Cognition, Loughborough.
Bakel, A.P.M. van (1994). Assessing Strategy Questionnaire For Architectural Styles of
Designing (ASQ-FASD). Paper 2nd Design and Decision Support Systems in
25.
conference, Helsinki


