18 EX ANTE RESEARCH

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" … designers regard themselves as integrators, researchers do not see them in that rôle."

"Instead of regarding designers as practitioners who are supplied with knowledge by researchers, it is possible to see design as the study of potential or desirable futures, thus, putting researchers and designers on a more equal footing." [a]

18.1 EX ANTE AND EX POST

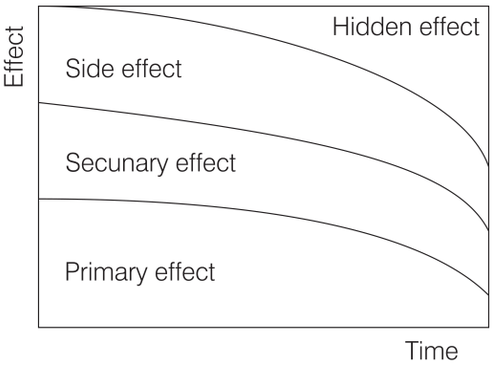
The design is ready. The explanation of the plan is clear and well founded, there are no mis-understandings about the functional programme, there is a clear relation with the adjacent scales, the strategic intervention is defined, the proposal is delineated, the legend is unequivocal. Deliberation, debate or realisation? How to continue?

In a competition different designs are made. Which design should be chosen?

A student shows his design to the teacher for judgement. Can the design be improved? What aspect is essential?

A design has been made to explore a possible future.

These are four cases in which ex ante evaluation can be used to discuss the qualities of a design. Ex ante means 'before'. It is the opposite of ex post, 'after'. With ex post research, a design can be judged on actual effects. Since ex ante research is done prior to the realisation of a design, *actual* effects can not be measured in this type of research. Therefore, in ex ante research evaluation criteria are chosen based on what is *expected* to be significant. Ex ante evaluation is regularly used in policy sciences to determine the *probable* consequences of activities. A well-known form of ex ante research is environmental impact analysis, where environmental consequences of proposed activities and alternatives are studied in advance.[b] Ex ante research can also be valuable to research-driven design in technical disciplines. In this context, the aim of ex ante research is to critically discuss and evaluate future consequences of a design, prior to realisation. One thing is certain: the future is uncertain. The uncertainty will only increase with the time-frame of the study. The more uncertain the future, the harder it is to forecast developments surrounding the design and the wider the variance of possible effects. When the time-frame is lengthened, more hidden effects will be revealed (see figure 141). It is obvious that this complicates ex ante debate.



141 The relationship between time and effect[c]

18.2 DIFFERENT FORMS OF EX ANTE RESEARCH

Within the research-driven design context two different forms of ex ante research can be defined. First, ex ante research may compare the quality of the design to the original brief.[c] A design should be a technical composition based on the original design assignment, unless the designer altered the original brief with good arguments (in consultation with the client). Anyway, during the design process, choices are made. Consequently, the design is just one of the possible operationalisations of the original brief. The second form of ex ante research is directed to testing consequences of design choices, with respect to aspects (contexts or perspectives) relevant, but not explicitly stated in the design brief. An example is the effect of design intervention on higher or lower scale levels, or on related sectors.

The second form of ex ante research concentrates not only on expected consequences, but also on not-expected or not-anticipated consequences. A distinction can also be drawn between desired and undesired consequences (see figure 142). Increasing insight in the effects of a design can result in adaptation of the brief and a new design.

	desired	undesired
expected	1	2
unexpected	3	4

142 Framework to map consequences

18.3 EX ANTE EVALUATION IN ALL PHASES OF THE DESIGN PROCESS

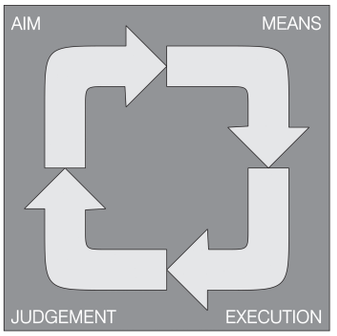
The previous section shows that ex ante research can be useful in different ways when judging a design. Amongst designers there is much difference of opinion as to judging designs.

a Heide, H. ter and D. Wijnbelt (1996) *To know and to make: the link between research and urban design*.

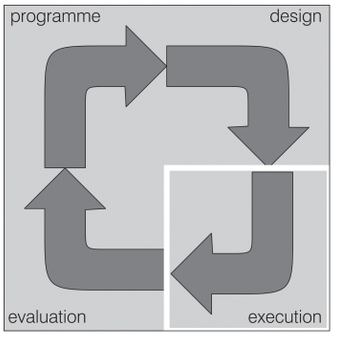
b Lehning, P.B. and J.B.D. Simonis (1987) *Handboek beleidswetenschap*. p.121.

c Source: Peters, J. and R. Wetzels (1998) *Niets nieuws onder de zon en andere toevalligheden*. p.51, Figuur 2-5 Soorten effect.

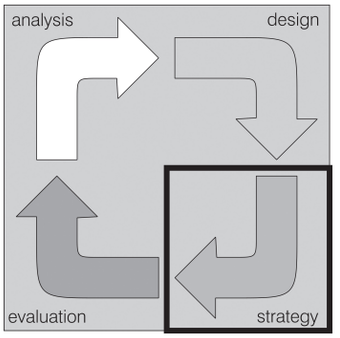
d It is self-evident that the design also has to comply with legal demands (sizes, construction, environment, participation, etc.). Nevertheless it can be very interesting to check whether the designer has used innovative ways to deal with these demands. See page 1 for programming research.



base cycle



cycle in practice



cycle in education

143 Three descriptions of the planning cycle[c]

The first, most dominant, one is the opinion that work is done when the design is finished. The client then needs to judge and decide. Thereupon the designer can change rôles and becomes, for example, project manager. In this opinion ex ante evaluation can be an important tool for the client.

The second group is of the opinion that when a design is made, judging it is the responsibility of both client and designer, or at least of the profession. In this case ex ante research can be an important tool for both designer – during, and at the end of the design process – and client.

Moreover, any serious discussion about a design, no matter what stage of the process, contains elements of ex ante research. However a study only deserves the denomination 'research' if it is clearly embedded in the planning cycle and respects the demands of research (see figure 143).[a] Design as a process concerns all steps of the planning cycle. The relationship between a design and the cycle clarifies the place of different forms of evaluation research. *Ex ante* research helps to obtain insight into the selected effects prior to execution, while *ex post* research stresses actual effects. *Ex post* evaluation also contributes to the body of knowledge of the discipline to be used as input for new designs. The third form, *andante* (ongoing) research supports the design during execution, and is especially valuable in monitoring long-term processes, e.g. rehabilitation of city centres, districts and neighbourhoods.[b]

18.4 DIFFERENCES BETWEEN DISCIPLINES

Content of ex ante research is not the same for each discipline. The difference is caused by different interpretation of the word 'designing'. Generally designing means creating. In Architecture, Building Technology and Planning this is translated in creating space or the built environment. The product is something, say, a building, façade or city structure. On the other hand, in a discipline like Real Estate and Project Management designing can refer to creating processes or decision support systems (DSS). The content of ex ante analysis changes with the change in interpretation.

Secondly, the built-environment (sub)disciplines differ in object and scale. Evaluation of an architectural design will be more focused on building, while evaluation of an urban design will be more related to collective parties in society and the long-term.[d] The content of ex ante research (focus) will change correspondingly.

Thirdly, there are different products within the same discipline asking for a different accent in the analysis. For example, in architecture a difference can be made between buildings designed with certain qualities, like form or sustainability, and buildings that should be seen as statements. The latter is an artistic and intellectual activity: to give colleagues and the public something to look at and think about.[e] Both types of design are necessary for continuance of society, but evaluating the designs ex ante will result in different accents.

18.5 ONE-SIDEDNESS, PITFALLS AND SIMPLICITY

Discussion on design belongs to the discipline, as periodicals, books and public media show. However, from a scientific point of view, these judgements are limited in usefulness most of the time, as they are based on selective and implicit aspects.[f] Good evaluations, also ex ante, concern:

- positive and negative aspects;
- the object, the, the location and processes and values
- explicit quality criteria;
- contribution of all (future) actors;
- clarity regarding weighing of arguments by critics towards their final judgement.

Designers are familiar with a number of pitfalls when designing.[g] In order to learn from these, ex ante evaluation must pay thorough attention to:

- reciprocal relationship between the analysis and composition;
- relationship between parts of the design;

a Roozenburg, N.F.M. and J. Eekels (1991) *Designing is a special way of solving problems*, p.76. The authors connect designing with the empirical research cycle of A.D. de Groot.
b For a very good text about monitoring and evaluation, see: Moore, B. and R. Spires (2000) The development, monitoring and evaluation of urban regeneration strategies, Chapter 10.
c Hulsbergen, E.D. and I. Kriens (2000) *Planvorming*, Chapter 2
d In this sense the problem of earnings and costs is also different in urban building and in architecture.
e Dijk, H. van (1981) *Maak weer eens een meesterwerk*.
f Langdon, P (1990) *Urban Excellence*, Chapter 1.
g Lawson, B.R. (1990) *How designers think, the design process demystified*, Chapter 12

- relationship of the design to social and scientific questions;
- quality of the data used as arguments to design decisions;
- actual meaning of models used to explain the design;
- relevance of design images to approach the stated problems.

A design can also be evaluated by attention to recent developments; for example, to problems in urban areas.[a] Relevant criteria can be formulated in terms of the consideration the design gives to:

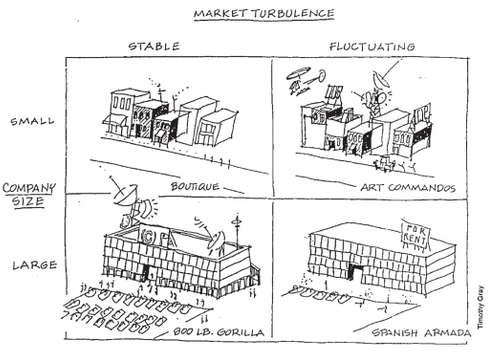
- integrated approach (versus simplistic problem definitions and mono approaches);
- multi-functionality (versus mono-functionality, e.g. only housing);
- mixed ground use (versus one sided use; alternating use of functions and groups, without conflicts; also against neglect);
- local synergy (versus isolated projects);
- public-private and other pp-partnerships (versus insufficiently supported, separate initiatives).

18.6 USING SCENARIOS IN EX ANTE EVALUATION

To determine the effect of a design scenarios can be used.[b] Many people think scenarios predict the future, whilst it is really about getting prepared for the uncertain future. Scenarios can be used in ex ante evaluation to determine possible future developments in the context of the design. Scenarios are images or descriptions of possible, probable or desirable future developments.[c]

To show how scenarios can be used when making (design) choices we will use the example of an architect designing an office for a client. In the traditional design process architects hardly ever use scenarios. Instead, they try to understand the client as well as possible. This understanding is then used to design a building that in their opinion fits current and future needs of the client best. This way only one of many solutions is designed; as a consequence many buildings need to be renovated or changed only shortly after they are first occupied. Testing the design in various scenarios representing alternative ways of using the future building can prevent this.

The use of scenarios in the design process is described by Brand.[d] He uses the example of a film and television company – Colossal Pictures – operating in a turbulent market. This company had to choose between renovating many small buildings or constructing one big new building (see figure 144). To determine possible consequences of this choice critical developments surrounding the company were determined. Analysis showed that the growth of the company and its need for real estate was mainly dependent on the developments in the film and television industry: would the market stabilise or fluctuate? By analysing the consequences these market conditions would have in both accommodation alternatives, Colossal pictures could make a better founded decision.



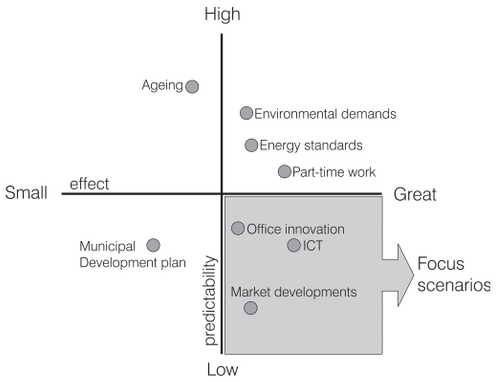
144 Colossal Pictures needs to choose between constructing one new building or renovating many small buildings; probable consequences are evaluated ex ante.

18.7 IDENTIFYING CRITICAL SCENARIOS

The examples in the previous section have shown the usefulness of scenarios in ex ante evaluation. But, how can one choose the developments that should be included in the ex ante evaluation of a design?[e] Political, spatial, technological, cultural or economic developments? The first step is to determine the right variables for a critical scenario is defining the driving forces. An architect designing a building for a client can, for example, try to identify the forces that will affect the organisation needing accommodation.

To determine the driving forces one can start with analysing past developments. The architect in our example could try to determine what developments influenced organisation and use of the current building in the past. Examples of developments that influenced the use of office buildings in the past are information and communication technology and growth of the number of part-time employees, stimulating double use of workplaces.

a Bekkering, H. (1998) *Stedelijke transformaties*.
b See: Dewulf, G.P.R.M. and P. van der Schaaf (1998) *Portfolio management in the midst of uncertanties: how scenarios can be useful*; also: Dewulf, G.P.R.M., A.C. den Den Heijer et al. (1999) *Het managen van vastgoed binnen een publieke organisatie*.
c Compare: Draak, J. den (1993) *Van blauwdruk naar draaiboek, scenario's in de ruimtelijke planning en volkshuisvesting*, Chapter 1.
d Brand, S. (1994) *How buildings learn, what happens after they are built*.
e See also: Thieme, J.C. , D.J.M. van der Voordt et al. (1989) *Effecten van grootschalige ingrepen, een programmeringsstudie*.



145 Co-ordinate system to map the predictability and impact of developments surrounding the design.

A second way to determine driving forces is a workshop or brain-storm session with the client, experts and future users. What developments do they think will influence the future use of the building? What effects would those developments have on the brief or the usefulness of the current design? This analysis can give insight in the need for flexibility. In a session aimed at determining driving forces, it is important that the people involved let go of the current situation and think about what might happen (as opposed to what they think will happen).

Based on this analysis of driving forces, various scenarios can be defined. There are different ways to define such scenarios. First of all, trends can be extrapolated into the future. This results in a 'trend' or 'reference' scenario. It is however only one possibility. To define more scenarios, it is important to vary driving forces that are hard to predict and that will have big effects on the design. Such driving forces are called 'critical uncertainties'. Moreover, when evaluating a design it is useful to create a bandwidth of scenarios by using extreme scenarios. To determine the critical uncertainties that characterise these extreme scenarios, one can use a co-ordinate system (figure 145) based on the axes predictability (high or low) and effect (great or small).

The difference between the various scenarios should be based on uncertainties located in the lower right corner of the picture, since reasonably predictable developments (like ageing) can develop similarly in every scenario and developments that have no effect will not change the design. Experience shows that scenarios in determining possible consequences are a useful instrument during the design process. However, it is important to keep their number limited: three or four suffice. Too many scenarios will confuse.

When the scenarios have been defined, the next step is to determine the consequences of a design in a certain scenario. A design doing well in more than one scenario is called robust.

18.8 EXAMPLE: THE NETHERLANDS 2030

An organisation using scenarios regularly to determine the effects of the spatial planning policies of the Dutch government is the *Rijksplanologische Dienst* (RPD). In a study 'The Netherlands 2030', the RPD described four different visions of the spatial structure of the Netherlands in 2030. The policy (or strategy) Dutch government needs to pursue to realise these visions differs for every vision. However, the actual consequences of the policy (strategy) depend on developments beyond the government's control, like development of the world economy and the position of the Netherlands in world trade. This means that realisation of the vision depends also on these uncertain developments. To deal with highly unpredictable developments when formulating new policies, the RPD has tested the robustness of various policies by using three scenarios. For each alternative policy the effects in every scenario were determined.[a] This exercise was not performed to provoke selection of a certain policy. The goal was a discussion on the main themes regarding spatial structure of the Netherlands.

18.9 CONCLUDING REMARKS

Most people just want one solution or one explanation; preferably the one they had in mind for a long time, resulting in minimal resistance; or they just invented in discussion.[b] Consequently, opinion about the usefulness of ex ante evaluation during the design process is divided.

Strong emphasis on creative aspects of designing can be a way to distance oneself from 'known' and 'tested' solutions. In that case ex ante e;;valuation might be experienced as a burden instead of a support. Especially thinking about probable or conceivable developments that might influence the design will stimulate the designer to think about the future, prompting new ideas. Moreover, ex ante evaluation helps to expose popular beliefs about benefits, and pays attention to neglected or hidden burdens. Consequently, the actual choices become more realistic. For the practice, scholarship and education of the professions, this kind of research needs further development.

a See: Rijks Planologische Dienst (1998) *Nederland 2030, Discussienota verkenning ruimtelijke perspectieven*.

b Charberlin, T.C. (1965) *The method of multiple working hypotheses* (previously published in 1890, also in 'Science'). The author mentions the 'parental affection' scientists may experience for their hypotheses and expectations.