

**DESIGN SERVES AND IS DEVOTED TO THE PERMANENT INCREASE OF THE QUALITY OF MAN-MADE ENVIRONMENTS**

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**What means 'integrated design'?**

*Design*

The term 'design', as we all know, became inflationally popular over the last years. It is not only used for the established disciplines any more like for example 'industrial design', 'product-design' or 'communication-design'. The term 'design' by now covers almost all fields of our society: We find 'hair-designers', 'nail-designers' and even 'designer-drugs'.

The 'design' the i/i/d has in mind probably should be protected from its own success by questioning 'what comes next?' if 'design' seems to have reached its limits. How will design develop in the future? 'Design' is defined not by focusing on the artifact, on the physical object for example the poster or the web-site. Design should be

defined by focusing on the humans, the user, the recipient of design.

In this definition design is the conscious creation of relations between humans and their artificial environment. This means the object is not longer the main aim of design activities - it is more the subject, the humans with their needs, expectations, wishes, demands, possibilities and limits.

The relations or better the processes between humans and their artificial environment do have a very complex character. They are influenced by what we see, feel, touch, hear, use, operate, consume - by all our senses.

This means that the processes between man and his designed environment are based on human perception and interpretation. They are combined with technological, economical, ecological and social aspects.

Every single design affects these relationships.

And the results of our design-work, or better 'artifacts' are expressions and fruits of these arranged processes.

*Integration*

Integration is the opposite of separation.

Integration is far more than the sum of several parts. It is the creation of a system of these mentioned parts - a network with several aspects and it's own dynamic. Integration works only if the different parts fit together.

To generate development and innovations in research and science in design-disciplines a number of promising 'integrations' are mentioned:

- Integration of formerly separated design-disciplines
- Integration of specialization and generalization
- Integration of theory and practice
- Integration of technology and arts, culture and commerce
- Integration of technological innovations and human factors

Today, the most interesting fields regarding technological, social, scientific or design aspects can be found at the intersections, the borders, the overlaps of different patterns, the places in between.

All classical fields in design are highly developed and specialised, but new things do happen between them.

Is the design of UMTS-mobile telephones with integrated internet-access, calendar, colour-screen, touch-and writepads and voice-controlled e-mail account only a task for industrial-designers, for communication-designers, graphic-designers or only for ergonomic-engineers? The new challenge lies in the cooperation between these disciplines...Integrated Design uses and creates different fields of knowledge. It canalizes the knowledge and combines the fields to one effective instrument. Specialisation times generalisation - it is multiplied with each other.

The required skills of a designer in the different phases of the design-process are extensive and demanding and it is necessary to act and care in a 'generalistic' way. The designer has to analyze, calculate, evaluate, generate, to define structures, make plans, drafts, and later realize them.

After all these skills are only preconditions for a successful arrangement of content, which itself requires a lot of creativity and experience.

There is always an uncountable number of professional disciplines participating in 'design-projects' and each designer is obviously not a specialist on every field. But a designer needs to be a specialist in understanding different thoughts and problemsolving-strategies. He ought to learn to understand the mass of different fields and to lead these to an integrated, problem-oriented process. Designers are specialized generalists oder generalized specialists – in any case they are the hosts of integrated processes.

If design wants more than only work in predictable ways on tasks defined by others, design can not give predefined answers to the question in which category or way a problem could be solved.

Usually the solution for an industrial-designer is the product, for a graphic-designer the poster, for a screen-designer certainly the internet-page.

But as long as the thoughts remain within our own limited space, we will never find exactly the symptoms behind. It is necessary to dissolve borders.

For two years now, the Institute of Integrated Design translates this way of thinking into a way of acting with concrete results.



Instead of thinking and working in traditional design disciplines and striving for preconceived categories of solutions, the institute works transdisciplinary on subject- and problem-oriented projects of research and development, which integrate several fields of design and science.

Interdisciplinarity, teamwork, openness and curiosity are basic requirements for this approach.

On one hand, the institute is an 'An-Institut' of the 'University of Arts, Bremen' and cultivates a close relationship between science, students, trainees, and scientific work-methods.

On the other hand it also is an economically oriented enterprise that holds relations to clients which can be companies and institutions of all sizes, and finally it is an enterprise which is rated by its success.

Even in its structure the institute bases on integrational ideas and combines in a very effective way scientific research processes with economical goals.

The institute is recognized as an interesting partner for students who want to work on professional, integrated projects under professional conditions for example as assistants, trainees or graduates.  
And of course there are offered real jobs as well.

The i/i/d is also a partner for companies and institutions which are interested in problem-analysis as well as in the creative solution processes that lead to design and final form – especially for those companies which intend to combine innovative thinking and action with economic success.

To this end, the institute has defined eight fields of work that are of social, technological and economical interest in fundamental questions of designing man-made environment.

- 1) future of work
- 2) future of production
- 3) future of mobility

- 4) future of communication
- 5) future of living
- 6) future of leisure
- 7) future of medical care
- 8) future of learning

The i/i/d experience of the last two years with about 40 projects with 30 clients shows that the bond between academic-scientific knowledge and the economic demands of the clients creates a strong and successful force that leads towards the future.

### Introduced projects

#### Harbour-tug

The client was the 'URAG – Unterweser-Reederei AG' in Bremen and gave the institute the opportunity to apply the integrated design process on a harbour-tug.

These very small but very powerfull ships maneuver large container-ships in harbours by tugging on board fixed cables.

One of the main tasks in the beginning was to analyse and understand the operation-structure of the tug and find out where potentials for a new product-concept could lie.

This analysis did not only include the physical, ergonomical aspects, it also included for example the psychological aspects of the users (how do they think about their own tool?) and of the clients who have to make the decision to spend a lot of money (what do they expect from this investment?).

It is not possible to name all results of this analysis, but one was extraordinary interesting and caused far-reaching consequences no one would have believed in the beginning of this project.

With a complete reorganisation of the operation-structure of the tug it suddenly seemed to be possible to reduce the needed man-power on this ship from three to two persons!

And because of the importance of the operational costs of (that means mainly the salary of the crew) in relation to the costs of a production in Germany the new concept became this important to the client.

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Extensive consequences this reorganisation of the operation-structure brought to the project through different fields of changes profitably carried out by integrated design.

*Augmented Reality Device for Astronauts*

One of the results of the 'integrated design processes' of the i/i/d Institute of Integrated Design is an augmented reality based wireless communication device for astronauts on the International Space Station, ISS.

The client 'Astrium' witch formerly was called 'Daimler-Chrysler Aerospace AG' asked to support their development with integrated design investigation.

Astronauts are leaving the planet to run among other things experiments under micro-gravity conditions in their laboratories. The number of jobs and devices are uncountable. And very often it was nessesary to waste expensive time with studying operation-manuals for the experiments.

This device increases the time you need for learning to operate or to maintain an experiment by using augmented reality.

One of the tasks was to analyse how a body carried tool which worked with state-of-the-art electronical equipment and does not exhaust after hours of use could be designed.

How is the Astronaut able to communicate with the ground-crew? How does he get additional information to what he sees? Visor-glasses, cameras, voice-control, headsets...

Following the institute lead this project to construction and production in rapid-prototyping-processes with the result of a first test-serie.

The necessary equipment back-pack was also designed and produced by the Institute.

The device - of course under terrestrial gravity conditions - was usability-tested in the Columbus-Laboratoty-Model of the ISS. Resistences, ergonomics, functional aspects ...



The result was a product which was launched the first time at the CeBit 2001 on the Astrium Stand in Hannover.

**Last not least**

The i/i/d Institute of Integrated Design in Bremen was very honored to take part in the convention 'Designing Designers' 2001 in Milan and with this it would like to invite all interested students, designers, companies and institutions to look at - or possibly participate in - it's work.

'The best way to foresee the future, is to invent it'.