

## Intelligente Bygninger - andet og mere end IBI/ Intelligent Buildings and more than IBI

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### ABSTRACT

The concept of Intelligent Building was established 1982 by AT&T. The Informart building was erected in Dallas to demonstrate how advanced IT from different suppliers could be used in the intelligent building. Now almost 20 years later industry and researchers again starts to talk about new services in the intelligent and responsive buildings and digital cities. The presentation gives an overview of existing and potential new services of the intelligent buildings and how these services may be designed and implemented using advanced IT. Special emphasis is on the relation between new services, user interfaces, the cooperative building and underlying knowledge. The paper shortly summarizes (headings) some of the issues raised during the presentation. The presentation can also be found at our home WWW site under 'Presentations'.

### INTRODUCTION

For almost 20 years we have talked bout Smart Houses, Intelligent buildings, and Responsive Buildings. After years of trials, demonstrations, creative design and

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<http://it.civil.auc.dk/>. Presentation at [http://it.civil.auc.dk/it/presentations/ibi\\_29\\_3\\_2000.html](http://it.civil.auc.dk/it/presentations/ibi_29_3_2000.html)

standardization efforts we can now experience an accelerated pace in implementing some kind of intelligence in buildings.

At the same time there is a lot of talk about the digital city. A city providing new in most cases not yet defined IT based services to its inhabitants and visitors (both physical and virtual). Of course there is a global social and cultural scale also in the process namely the forming of global villages/regions with other than geographic borders. This latter evolution can be expressed in terms of cultural, social and economic parameters (Christiansson 1992).

## PERSPECTIVES



### The Global view

- Cultural parameters
- Social environment parameters
- Economic parameters

### The Digital City View

- Acquire information
  - About commune service
  - Planning data
  - City resources (companies, services, associations..)
  - Shops
  - Museum
  - Libraries
  - Virtual Universities
  - Maps
  - News

- ....
- Request information/services
  - Social commune service (school applications,..)
  - Courses, learning material
  - Property data
  - Energy flow control/data
  - Goods flow control/data
  - Traffic flow control/data
  - Water supply control/data
  - Educational on line support
  - Infrastructure service/capacity/media/security
  - Leisure (order theatre ticket,..)
  - Status information (buses,..)
  - ....
- Input information for decision support
  - Democracy process (feedback on decisions, voting, decision support,..)
  - Local planning (views on plans, discussions,..)
  - 'Speakers corner'
  - ....

#### The Intelligent Building view

- User service
- Operation and Maintenance
- Administration

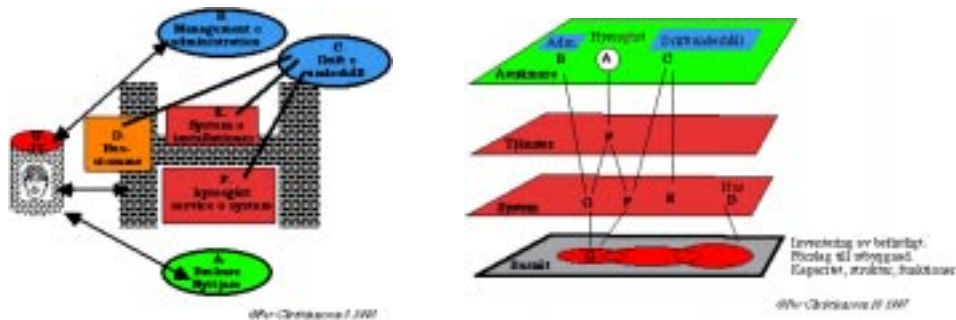
### IT EVERYWHERE



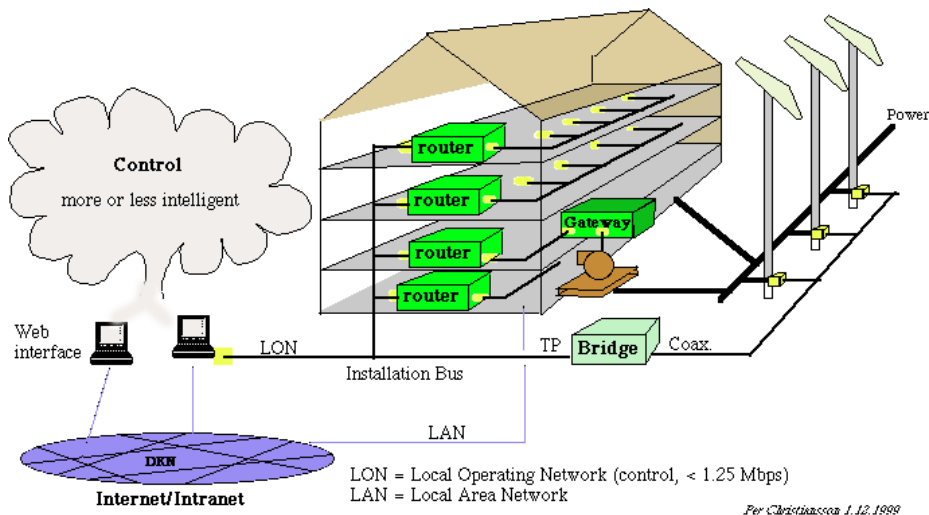
- Everything on the net and more often on local wireless networks.
- IP next generation enough with connection addresses?
- measure the building condition and performance

- the SERFIN example with technical maintenance information handling on the WWW

## IBI - DIGITAL CITIES - NEW SERVICES

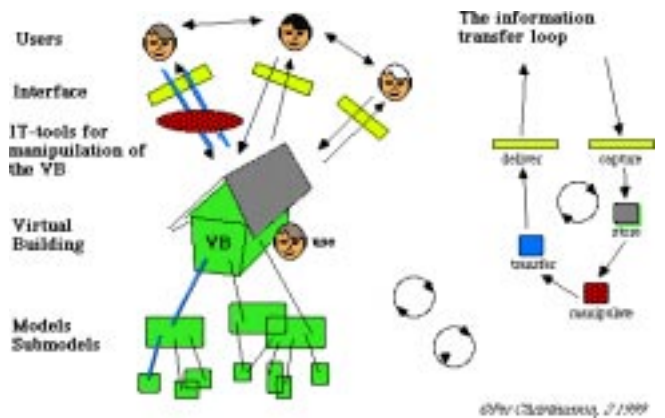
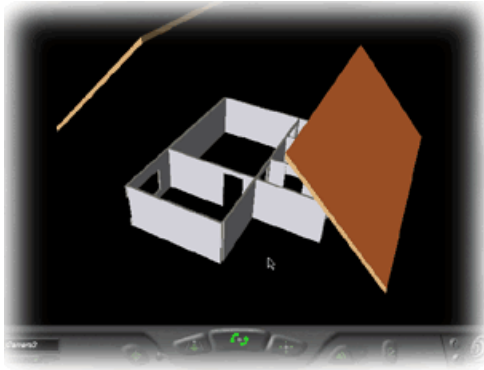


- It started around 1980 (INFORMART building 1982)
- Many users with services requirements
- Smart House, LON, EIB,.... STANDARDS
- Net, system, services links
- Services have to be defined and tried out



Services announced today by companies are typically - fire alarm, energy control, heating control, Telephony/computer net, ventilation control, climate, surveillance, lightning, power, security, passage control, automatic door functions.

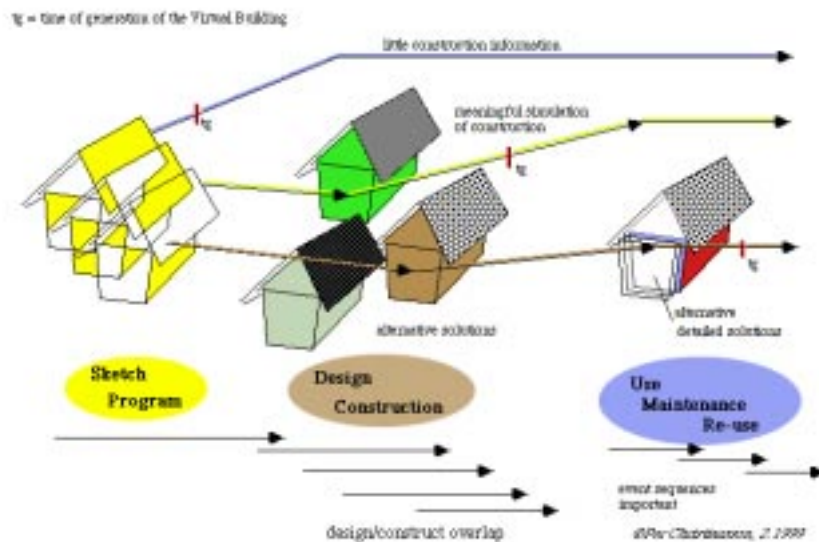
## VIRTUAL BUILDINGS



- Digital models of the reality Models are formal incomplete *descriptions* of users, applications, IT-tools and contexts.
- The reality can be *represented* with many types of (knowledge) representations.
- The computer models are *accessed* through man-machine interfaces (multimedia).

With temporal data introduced into the VB new opportunities arises:

- we can store snapshots of different building processes and *backtrack* to make a re-design re-simulation with changed requirements (regeneration of the VB),
- it should be easier to document and retrieve *causal connections* over *time* and *space* in the VB,
- storage of *lines of reasoning* and possibilities for analyses of their relations
- effective use of the time parameters in the *life time documentation* of building behavior



## COMMUNICATION AND INTELLIGENCE

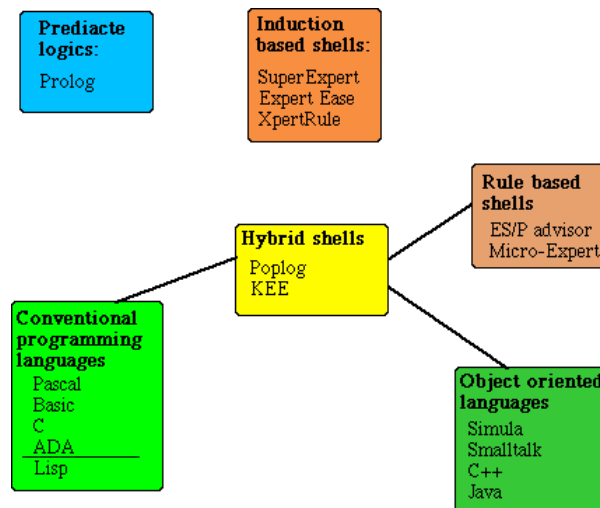
The building shall support communication in all respects also the communication activities involving its users. The building can be characterized according to

- environment/context in which it is placed (invoking different kinds of loads from nature, people, and systems)
- intelligence should be transparent, simple and understandable to the users
- IBI (building life time) solutions must be standardized as far as possible
- the IBI should be able to change states (clearly defined) with respect to functions and users over time and building spaces
- the IBI should have a long term and short term memory
- the IBI should be well documented, easy to program and re-program (over time-space) during use
- canalization is the road that shall house 'wires' carrying new services communication
- have secure information domains (ethernet may give some problems in the start)
- be open to XML based communication between applications
- be able to also handle high band width information transfer.

Intelligent system can be of different kinds (and combination of)

- logic
- decision trees (induced)
- rule based

- Object Oriented
- Neural Net
- ...



Languges and programming shells for writing knowledge based systems.

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## References

Christiansson P, 1998, " Den digitala staden". (Underlag för utarbetande av kravspecifikation för upphandling av tjänster för utveckling av ett enhetligt lokalt nätverk för digital kommunikation i Landskrona. (25 pp.).

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