

ORGANISATION OF A DOMOTIC PROJECT (INTELLIGENT BUILDING)

THE ROLE OF INTERFACES

by **Edmond-Antoine DECAMPS, Françoise PECOT, Guy ROYER.**

**University of RENNES,
CAMPUS de Beaulieu - 35042 RENNES - FRANCE.**

I - INTRODUCTION

In Europe area, the intelligent building concept, also named Domotique, begins to appear as being more and more well-known, in spite of its low development, happening not as fast as some prospective studies predicted it before. (1)

This can be considered as a positive standpoint, background reflexions non coming together with innovation thinking and hence preventing the observed initial failures caraterizing nowadays too much unmatute projects.

II - THE MULTIDISCIPLINARY APPROACH

It seems that the correct approach of custom devices introduction in modern buildings remains a multi disciplinarity one. The main problem consists in including that multi disciplinarity within the present action of building construction in Europe, excepted in the case of prestigious hi-tek projects.

The building construction activity and its uses are unfortunately too much hostile to any innovations maintaining their very safe position whitout the lightest risk or in remaking know-how of others at very low cost. Such point of view prevents the introduction of new technologies when other partners take into account the risk assessment.

These are mainly the reason of why any of innovative processes are only developed by big companies: they are only able to support the sophisticated studies under consideration.

Any process being considered, usuals partners are :

- the user,
- the customer-promoter,
- the architect,
- the design office,
- the main contractor,
- the subcontractor,
- the certification agency.



Relationships between architects and customers or promoters remain usually excellent, their common main goal being anyway to satisfy the customer successfully. The relationship between the architect and the subcontractors does not appear so much insured because being permanently occulted by the concept of package : Heat package, power package, etc... That situation produces a kind of slices cutting, being the cause of unharmony between various fonctions. Then, it can be recommended to obtain first the coincidence between various interests and partners under consideration. The remaining problem is that all these people do not speak or understand the same language and do not keep in mind the same point of view.

The classic example can be the case of that architect in charge of building design and imagining large windows pannels without taking into account air cooler or air heater location with their related technical problems due to energy loss or consommation, paid anyway by the owner in place.

All that category of mis-understanding problems are amplified by the custom devices introduction at home, the basic required background being out of range of the average people and specialized in the domain. That particular situation requiers intermediate jobs to manage that category of interchange problems.

III - ARE CUSTOM DEVICES (DOMOTIQUE) ABLE TO EVOLUTE BUILDING CONSTRUCTION ?

It can be usually observed that any new technology introduction may change habits, behaviours or knoweldges by an usual and classic feddback process. For example, the barreled gun invention, during the Middle Ages, made the castles built with large stacked rocks, unable to resist to ball's energy impact. In our times, the ascinter invention made the skyscraper concept a common reality.

For that reason, it can be possible that DOMOTIQUE introduction in building construction may change a lot of concepts well admitted in building design and construction.

The first hypothetic opportunity to do partly your job home may evolute successfully in modifying accomodations locations ; in terms of surface occupation and by creation of an internal silent well, considers as a core, opaque to external sources of noise or family disturbances. {2}

More generally, the concept of intelligent building, previously evocated yields to a new flexibility, taking into account any cultural evolution, generated by the whole opportunities given by innovation.

Otherwise, the main problem remains to determine the future of that evolutive process, at the present time impossible to predict efficiently by computer. Although computers can be used to access the possibilities in terms of evolution, but not the potential sensitivity of people toward custom devices which can be the real parameter initiating the evolution under consideration. Furthermore, many other parameters like social or cultural conditions must be also taken into account. For example, the T.V. monitoring system are well accepted by Anglo-Saxon people but it does not appear that they are as well accepted by other people like whose with Latin cultural background.

This proves that the unique custom devices approach in building construction does not exist, multiple custom devices approach must be inversely considered.

IV - THE CONNECTION BETWEEN INTELLIGENT BUILDING AND THE DIRECTIONS FOR USE VARIABILITY

The usual example, explaining the connection under consideration can be the case of the school building construction, initially designed in terms of pedagogic choices. Inversely, the progressive introduction of custom devices systems in the building design can modify consequently both the pedagogic content of classes and the whole building volume's uses in terms of multidisciplinary education.

IV - 1 / School intelligent building systems analysis

The analysis of the multiple connections previously mentioned being considered, four attractive poles can be extracted.

- Future buildings functions in school building,
- Control, command, communication technologies,
- The connection between previous concepts with the building construction,
- Pedagogic and didactic evolution related to domotique.

IV - 1.1 / Functions

It consists in the ability for environmental or accommodation functions inventing, by the use of continuous or not processes, in connection with any action regulating the whole.

IV - 1.2 / New technologies

To extend the availability of these technologies to students families, parents, teachers, administration staff or any external people to increase both efficiency and productivity, (these last couple of concepts being necessary to be defined correctly). Hence, these both poles remaining closely connected the redefinition to their respective content can obviously appear to be acquired.(4)

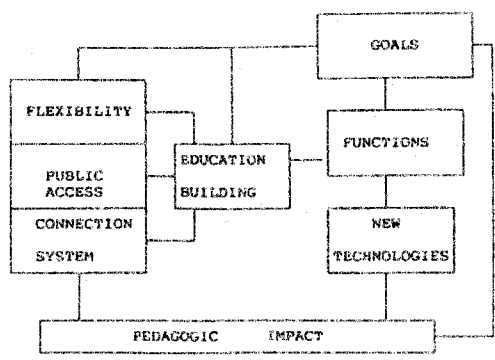
IV - 1.3 / Building construction

Three fundamental points characterizes it.

- The flexibility in terms of time or space leads to the capability to be adapted to any external condition changes. The spacial volume is organized as respect to the architectural and internal disposals. That particular situation requires a pretty good knowledge of the process of communication and information, in connection with the people in charge of these questions allied to a high level of partnership.

- The public access to any parts of the buildings to anybody includes the access to handicapped people. That leads to study the fluxes of people, information systems and guidance. This includes the economic standpoint (initial and operating costs).

- The connection system are related to the capability of various systems in filtering connections between people, accommodation, equipment and services. It can be useful to relate more accurately the architecture with internal or external communication networks, taking into account the real



importance of people in charge of the process under consideration.

IV - 1.4 / Pedagogy and Educational or Instructional Technology

That approach remains really very original. This very new environment modify strongly educational methods. Usually, teachers are considering innovation like an "aided teaching" method. Indeed, it is wrong and then it is now authorized to think that it is the whole educational process which is modified.

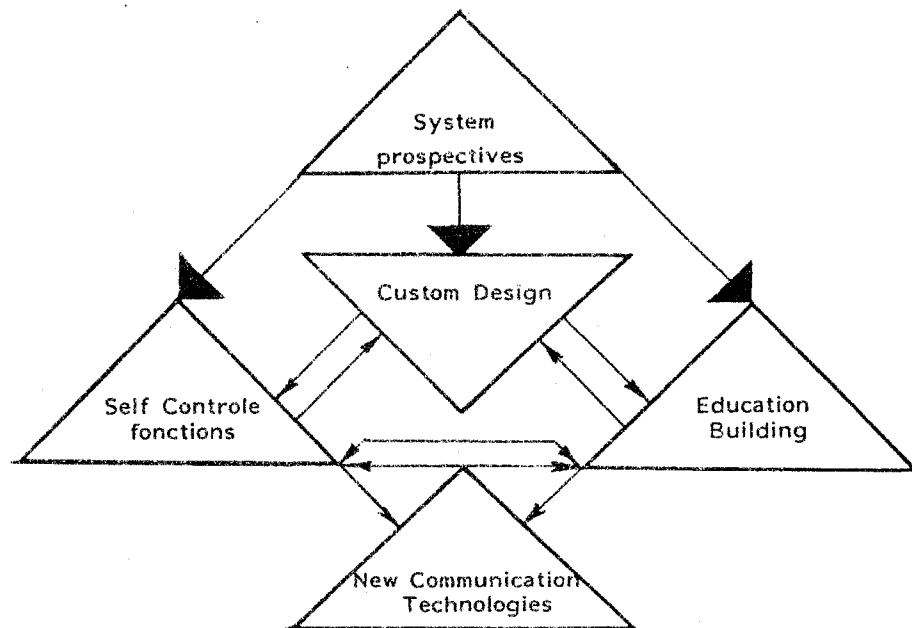
V - REQUIREMENT ANALYSIS

Usually, school building construction is only made in accordance with rules. Any pedagogic innovation is hared by the building design itself. It can be observed that the rules leads to a relaxation process between the times of consciensous of the problem under consideration, the time of its analysis and at least the time of its taking into account writhin the rules. But during that period, the technology evolute....

Building construction can be considered as an educational process, too, if perceived by that manner. The space volume under consideration can dominate particularly the "educational climate". Many unhumanized or in a very bad state classrooms, located in hot subarbs can be one of the major ignitor of urban violence. No maintenance, no order dirties in appearence are supposed to be accepted by the education system and then considered as one of the possible example to follow in life.

The introduction of "domotique" can also generate the new concept of school network, sharing their varioux available ressources in education between the scool members of the network under consideration.

Otherwise, it can be convenient to consider that most of requirements are not defined correctly. The requirements appearing as more or less imperative with the time of custom devices under development or installation can be the cause of an "autogeneration process" of themselves. The extra gadget, now appearing as not requires can appear in future as absolutely required by "must effect". This leads to approach one of the fundamental settlements of custom devices introduction : its reliability taking into account investments and operating costs.



VI - COST ANALYSIS

VI - 1 / Investments

The investments concept is taken within following lines with its extended meaning. Then, investments must include :

VI - 1.1 / Research in laboratories

The interest for fondamental research has been revelated by applied research. Then, the adaptation to accomodation of new technologies leads to new problems of fundamental research and considered till that time as unpior or sometimes not imagined. The cases of the late period to phasis change in heat storing material of carrying currents in electrical engineering the examples which demontrate that point of views.

VI - 1.2 / *Research and development*

Products or systems improvements must remain adapted and acceptable objects.

VI - 1.3 / *Research focused on psychology, culture, sociology and ergonomy*

Too much custom devices are not correctly used due to a non receptive mind of users or due to their complexity. Public users can not be always familiar with computer programming !

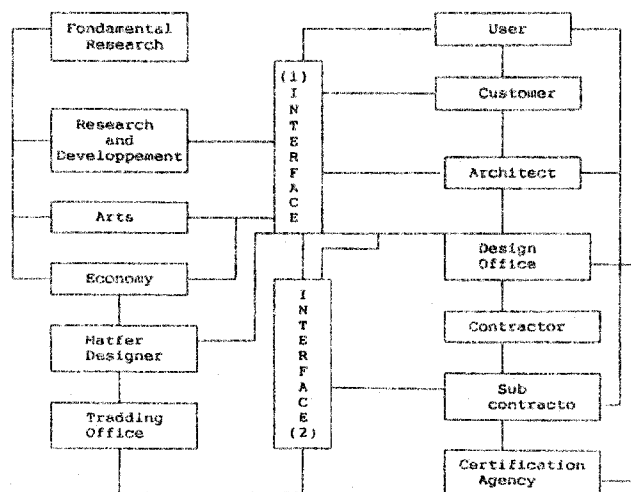
VI - 1.4 / *To informe and to educate*

This is an investment that must be made before and after the construction action. The education of architects, trading office people and companies' workers can be easy to admit but the main question remains the user's education, the connex question being its real technical background. It is the essential point of our communication that within the following chain.

user <----> designer <----> installator

It remains necessary to include **interfaces**, keeping each others their specific role.

These **interfaces** must keep the ability to translate the user demands, the technology capability for a given cost and the problems due to the installation in the construction organization. These interface must also keep a sufficient technical background and the ability to integrate the whole



connection between design and use. We include onesidely the whole aspects of these problems in the investments costs assesment because education and interfaces costs must be taken into account.

It seems to be a must for custom devices development. Thus, the main difficulty in custom devices development remains the exact sharing of costs among partners actions. The "makers makes" often without taking into account external conditions and the tradding sells also accomodations to make easy money. That situation characterizes the "shot view" conception of building activity and can be the cause of a progressive back of interest of publics owners for custom devices introduction. That fondamental question remains still asked.

Because of this, it seems to be important ot consider :

IV - 1.5 / Operating costs

Sometimes, the custom devices are introduced in building schemes when showing to public more particularly operating costs decreasing. That point must be considered carefully : any innovation can create new requierements and thus, the operating costs increasing The case of education building being considered, the problem can show a wider or not complexity :

- Wider because of the reciprocity of the following connection :

DOMOTIQUE <----> Pedagogy, then appearing with actions development. That requiers the filtering action to eliminate the background noise and to keep only signifcative information. To avoid an inform education system remains also a must, the teachers delivering easier education can be erupted by a presentation without relief, negligerating the human component of culture.

CONCLUSION

When taking into account the education system, the mutual benefit of the intelligent building on one side and its uses has been clearly worked out. DOMOTIQUE introduction in building construction is changing the behaviour, which can evolute the sociocultural balance in future. That "revolution" requiers in the first step the introduction of education in interfaces that helps its optimized introduction and use.

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