

Cultural and Technological Factors in the Individualization of Multi-Dwelling-Unit Building Façades

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ABSTRACT

Everyone is different from the neighbour and from him/herself through space and time. The Infill fit-outs are more and more capable of generating adaptable interior layouts, but the options are very limited as far as the façade is concerned. Logically, the façade should follow; not only responding to what goes on inside but also reflecting, or hiding, the very personality of the occupants. Easy and usual with suburban housing, that task is more problematic and actually very rare in the case of multi-dwelling-unit buildings. Various levels of individualisation can be adopted: differentiation by the architect, selection by the occupant form a “menu” offered by the architect, appropriation or additions by the occupant, variable or demountable façade components and movable façade panels. Of course, the freedom of expressing one’s individuality stops when in conflict with the neighbourhood: some directives should be agreed upon, some cultural values need to be shared and an appropriate technology is required.

KEYWORDS

Individualisation, multi-dwelling-unit housing, cultural values, adaptability, intervention of the occupant, interchangeable components, industrialised systems.

INDIVIDUALISATION OF THE MULTI-DWELLING-UNIT BUILDING FAÇADES

Basically, architecture is aiming at improving the life of the occupants. As each occupant is different from the neighbour and from him/herself through space and time, architecture should normally follow. So far, within the Open Building approach, the individuality of the occupants of a dwelling unit is addressed when a Support Structure is established and when the appropriate Infill fit-outs are available, thereby providing for an adaptable layout. Logically, individualisation should also be reflected outside, on the façade. That is often the case in a single detached or attached housing environment: the houses are usually different from one another and the occupants do intervene on the façades as the years go by, depending on the local culture.

But individualisation of the façade is actually very rare in multi-dwelling-unit buildings. The possibility is very limited in multi-tenant buildings as the occupants are usually restricted by the very wording of their lease and/or reluctant to invest in a place they don’t own. The possibility is more relevant in a condominium or cooperative situation. Of course, the freedom of expressing one’s individuality stops when in conflict with the neighbourhood. Therefore, the cultural values and differences need to be

welcomed or at least accepted whereas the technology applied should not interfere with the adjacent units.

ARTIFICIAL ANIMATION OF THE FAÇADES

The search for individualisation in multi-dwelling-unit building façades should not be confused with the efforts by some architect to “diversify” the façades just for the sake of breaking away from a repetitive module, without any reference to the occupants behind those façades. Various “tricks” are currently used in contemporary buildings: “zigzags”, random distribution of “special” features, “spinning” of a repetitive pattern, etc. These “tricks” are actually worst than a repetitive module as they give an artificial impression of diversity and actually deprive the occupants of a genuine expression of their personality.

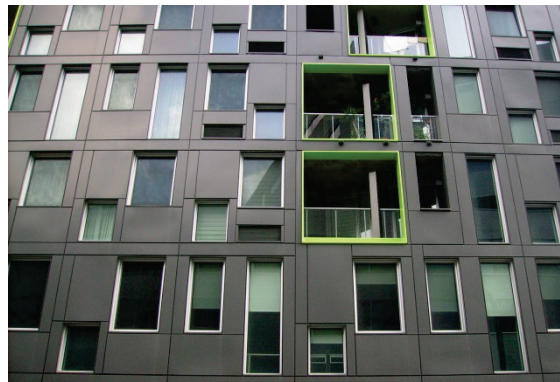


Figure 1: “Zigzag” and “spinning” façades of a housing project in Montreal

LEVELS OF INDIVIDUALISATION

The author has identified five basic levels of individualisation in contemporary housing façades, going from partial interventions to fully demountable and movable façade panels:

- Differentiation by the architect;
- Selection by the occupant from a “menu” offered by the architect;
- Appropriation or additions by the occupant;
- Variable or demountable façade components;
- Movable façade panels.

DIFFERENTIATION BY THE ARCHITECT

Aware of the importance of avoiding the “chicken cage” image and of distinguishing units from one another in a multi-dwelling-unit building, many architects have deliberately opted for some form of differentiation right at the construction stage. That option is especially justified when the architect does not know ahead of time the future occupants of those units.

The most well known examples of differentiation by the architect are the Corbusier’s “Unités d’habitation” in Marseille, Nantes-Rezé, Briey-en-Forêt, Firminy and Berlin-Charlottenburg. The inner walls of each dwelling unit’s loggia are painted with a different semaphore like set of colors. In addition, various types and articulations of the awnings complete the individualisation sought by the architect.



Figure 2: Façade of the Marseille “Unité d’habitation” by Le Corbusier

SELECTION BY THE OCCUPANT FROM A MENU

When the architect can meet the occupant during the design process, a “menu” can be offered within a certain technology and without increasing the cost compared to merely repeating the same or a limited set of variations. Then, the options can be closer to the interior planning, to the taste of the occupants and to the degree of visual intimacy desired. But the possibility to modify the selection later on is technologically doubtful.

The Molenvliet project in the Netherlands was designed along the Open Building approach.

Variations in window/panel/door/colours were in fact decided by the first occupants from a menu provided by the architect, Frans van der Werf. Of course, the colours can be easily modified through time by the same or by new occupants, but as the technology was not providing for easy dismantling, the window/panel/door placement is more or less bound to remain the same.



Figure 3: Façade of the Molenvliet horizontal multi-tenant Open Housing project

The “Institut de l’environnement” building in Paris is another example of selection by the occupant at the design stage. By introducing different spacers between the top and bottom, Jean Prouvé was able to economically generate five sandwich panel options out of the same mould: a large vertical window panel, a square window panel, a square window panel accompanied by a small horizontal bottom window, a small horizontal top window and a completely opaque panel. Then, it was up to the administration of the building to select the appropriate panels according to the functions of the rooms behind.

APPROPRIATION OR ADDITIONS BY THE OCCUPANT

Even within a very strict modular grid, the presence of different occupant can be felt either through their appropriation of the glazed areas, such as in the Mies van der Rohe buildings, or by operating shutters like in so many European cities.

In some cultures, the addition of personalized features is normal and allowed, as it is the case with numerous buildings everywhere in the world, notably with the old housing blocks in Hong Kong. However, the results can be considered quite “noisy” and even unacceptable in the context of some other cultures.



Figure 4: Five panel options produced by Jean Prouvé out of the same mould

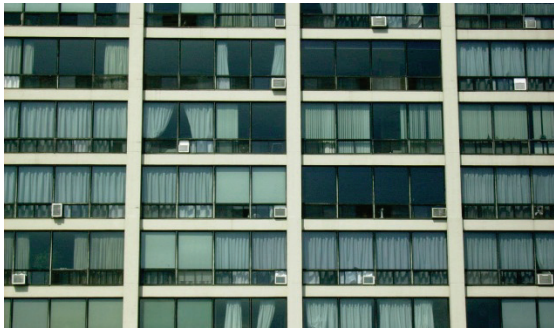


Figure 5: A Mies van der Rohe multi-tenant building in Montreal and street scene in Bilbao



Figure 6: Old housing block in Hong Kong

VARIABLE OR DEMOUNTABLE FAÇADE COMPONENTS

To introduce the 4th dimension, time, in the individualization of the multi-tenant façade, an appropriate technology has to be implemented. Otherwise any change would imply the destruction of the previous arrangement, an operation that would be both costly and contrary to the sustainability agenda.

NEXT21 in Osaka, designed according to the Open Building approach under the leadership of Professor Yositika Utida, is so far the most adaptable multi-tenant residential building in the world. The façade does affirm the interior planning as well as the very personality of the occupants. For instance, by looking at the façade, one can easily read that some occupants are extroverted whereas some are not.



Figure 7: NEXT21 experimental adaptable multi-tenant residential building in Osaka

The façade of NEXT21 adopts a demountable technology, using vertical metal profiles to support the glazing modules and to attach exterior multicolour stainless steel laths in front of an insulated wall composition. The exposed structural concrete beam is acting as a neutral horizontal boundary between the various options selected.

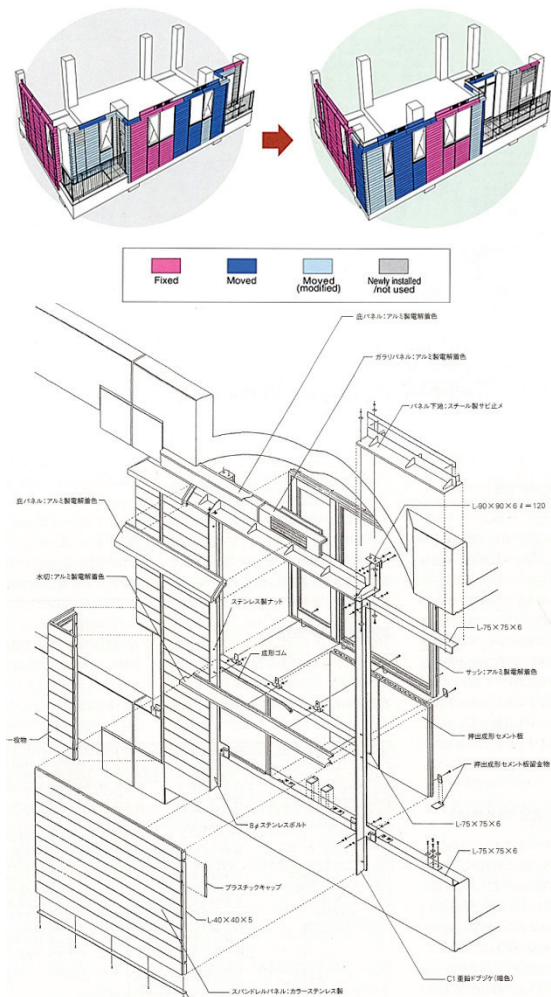


Figure 8: Components of the NEXT21 façade and examples of variations through time

MOVABLE FAÇADE PANELS

The most explicit and complete way to achieve full adaptability of the façade through space and time is to introduce a sub-system of fully movable panels. These panels should be easily and rapidly dismantled and relocated or replaced according to the needs of the occupant. Most likely, the work will not be done by the occupant but by some technical crew using off the shelf components. Afterwards, these components could be further personalized by painting or some other input.

Because they have to be autonomous, movable panels are completely different than the usual curtain walls which are usually installed in a progressive manner: when two windows share the same structural mullion, removing one disturbs the others; when two prefabricated curtain wall panels are installed through dowel connections, removing one disturbs the others.

The detailing of the movable panels aims at getting them easy-to-install from the inside without

disturbing the adjacent units. Two methods are available:

Introducing a framework of “neutral” mullions and/or lintels connected to the structure and designed to easily accept independent panels. Connecting independent prefabricated panels directly to the structure, with open joints overlapping horizontally and accommodating a gasket vertically. Jean Prouvé has investigated and developed movable façade panels for many residential and institutional buildings. The curtain wall he produced for the Berlin Free University building, designed by Candilis / Josic / Woods, is a clear statement in that direction. Large horizontal metal lintels serve as “neutral” boundaries between floors and support various options of glazing and opaque panels.



Figure 9: Movable façade panels at the Berlin Free University

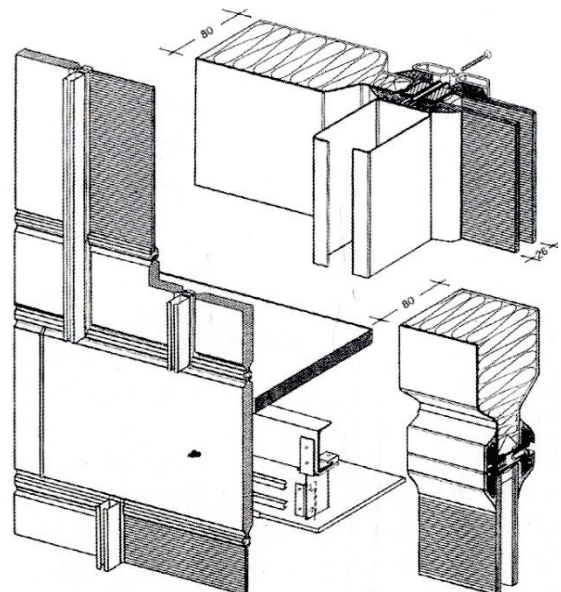


Figure 10: Details of the movable façade panels at the Berlin Free University

The horizontal connection is done through a neoprene gasket easy to open in a single operation. The vertical connection is facilitated by an exterior metallic support bolted to an interior profile through the same type of neoprene gasket. That support does allow for the changes to be made from the inside as well as permits the introduction of horizontal subdivisions between the lintels. Obviously, those details should be adapted to the new processes as well as updated in terms of thermal performances.

When connected directly to the structure, open joint lintels or full storey panels become autonomous and can then be dismantled, relocated or replaced without disturbing the adjacent ones. Full storey panels would normally need to be partly opaque in order to hide the floor frontage as the fireproofing required. For these reasons, the lintel method is usually preferred.

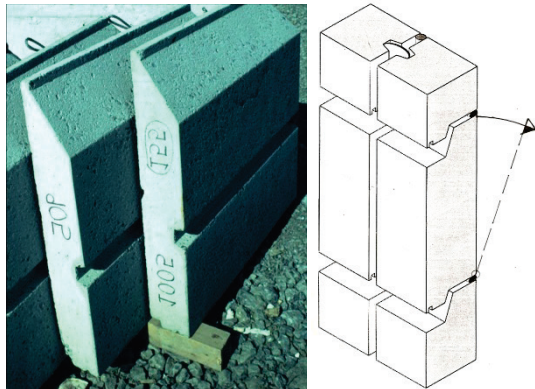


Figure 11: Details of precast concrete lintels / panels with open joints

The proposal for an Olympic Village in Montreal designed by the author, entitled “Cité-Jardin 76”, was also introducing autonomous movable panels, using narrow lintels and mullions to act as “neutral” boundaries between adjacent units.

FULL INDIVIDUALISATION OF THE FAÇADE THROUGH SPACE & TIME

Facilitated by “neutral” mullions / lintels or connected independently to the structure, the movable façade panels are capable of generating a dynamic and ever changing expression of the inner life of the dwelling units. When the interfaces between manufacturers are regulated, the possibility of integrating various types coming from various manufacturers can generate even more individualisation. Although some may consider it as “cacophony”, such a “democratic” venue would actually be more humane than the standardised “chicken-cage” façades encouraged by the some socialist regimes or the fuzzy tricks architects are sometimes using to artificially animate the façades. It is really a matter of cultural values.

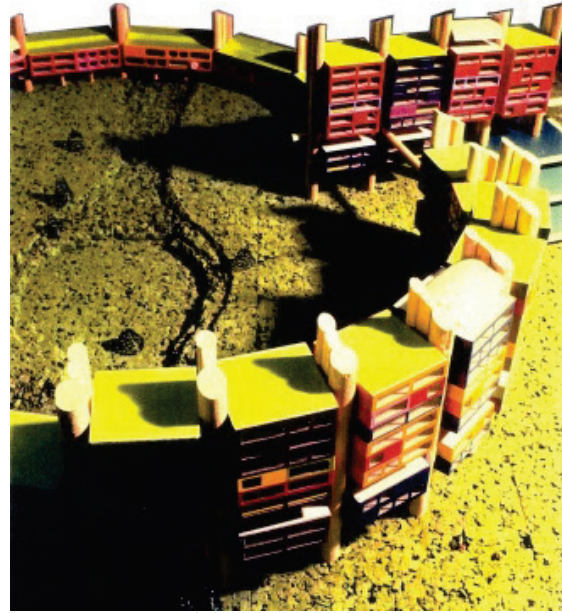


Figure 12: Individualised façade panels proposed in the “Cité-Jardin 76” project

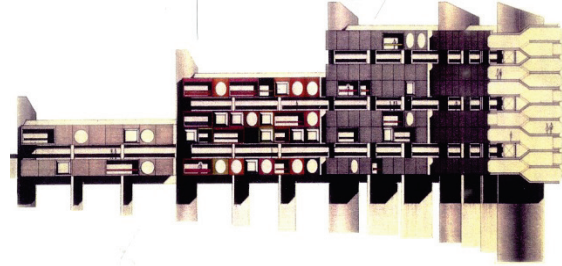


Figure 13: Open framework narrow grid integrating various compatible façade panels

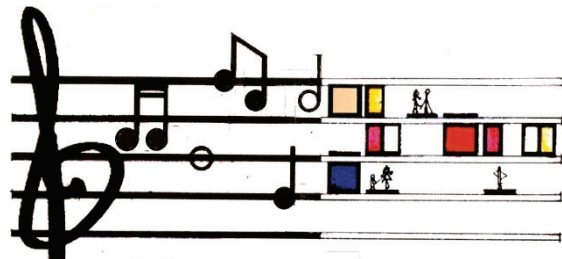


Figure 14: Analogy between music and the open framework grid

CONCLUSION

The façade is more than the building envelope, just like clothing is more than a comfortable interface between the body and the environment. Just like clothing, the façade should be responsive to the individuality and the personality of the “occupant” through space and time, whatever the level of appropriation available.

Obviously, movable façade panel sub-systems are the most responsive answers to external individualisation as long as:

- the cultural and aesthetics parameters are agreed upon collectively;
- a variety of glazed and opaque surfaces is offered;
- each dwelling unit façade respects the boundaries with its neighbours;
- the installation is done in a clean and timely fashion;
- interfacing rules are clearly spelled out both to simplify the process and to allow for an open sub-system;
- thermal insulation, soundproofing and fireproofing high performance criteria are maintained.

Then the “neutral” mullions / lintels or structural grids can be to an individualised façade what the stave is to music: not only coordinating the positioning of different panels but also generating ever changing urban scenery reflecting the very personality and evolution of the occupants. A new dynamic architectural and cultural language is then available.

CREDITS

Figure 1: Photos by the author

Figure 2: http://fr.wikipedia.org/wiki/Cit%C3%A9_radi%C3%A9use_de_Marseille

Figure 3: W104 Web-site

Figure 4: Photo by the author

Figure 5: Photos by the author

Figure 6: urbanomnibus.net + shutterstock.com

Figure 7: Photo by the author

Figure 8: NEXT21 – All about the NEXT21 Project

Figure 9: Free University Berlin

Figure 10: Jean Prouvé: Complete Works

Figure 11: Photo by the author and diagrams from Components and connections

Figure 12: Model and drawing by the author

Figure 13: Photos by the author

Figure 14: Drawing by the author

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