A House is not a Car

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Abstract
The paper will focus on the historic development of the urge to industrialize the residential building industry.
One method of avoiding environmental burden caused by building activity is through optimised and controlled production. Since the introduction of mass production in the automobile industry, architects have looked envious at its benefits. The car, and in particular its manufacturing process, has been adapted as a paradigm by many architects in many timeframes and for a variety of reasons.
The comparison of the building industry with the car industry however turns out to be faulty. The paper will emphasize on significant differences in evolution, status, life span and perception.
The conclusions show that the paradigm has become inadequate in our days. Recommendations of the paper include an alternative approach of mass production in housing and the plea for a more careful implementation of concepts from the automotive industry.

Figure 1: The components lay-out of a Toyota (left) and a 1950 Lustron house (right).
1 Introduction

In our era the global attention for sustainability and ecological consciousness shines a new light on the production of housing. There is renewed attention for efficiency. Aspects like reduction of resource depletion and better performing houses seem obvious and within reach. It seems a legitimate idea that industrialization, prefabrication and mass production are serious options when it comes to a more controlled production of houses. The doing-more-with-less slogan seduces us (again) to the advantages of mass production:

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Figure 2: The advantages of mass production: more with less.

Despite the fact that the building industry makes use of an abundance of mass-produced building components (bricks, tiles), mass production is a relatively uncommon feature on the scale of the (residential) building. It is however the standard in most other industries. The vast majority of the everyday products we use are manufactured and assembled in large quantities in an industrial way. Architects through the ages have always been rather envious of industrial designers and the realisation of their products. One product in particular had great interest of architects since its very beginning: the car. For the first time in history, buildings got company from a new kind of enclosed spaces.

2 Mass production and cars

The phenomenon of mass production becomes universally visible with the start and raise of the automotive industry (some decennia later followed by the aviation industry). The T-Ford, in production from 1908 to 1927, becomes the global icon of uniformity, sameness. “Any customer can have a car painted any colour that he wants, so long as it’s black.”, was Henry Ford’s proverbial quote. The fall of the T-Ford was somehow due to the introduction of (too) many colour options. The choice for mere black wasn’t coincidental, it was purely pragmatic. The process of painting and particularly drying a car body, took as long as 40 days and was the bottleneck in the production process. Black simply was the quickest to dry. [7] It seems a pragmatic dogma reminiscent of the reason why houses should be made of brick or wood. Lack of historic notion of how a car should look like, later made the implementation of changes and innovations relatively easy and fast.

3 History of the car paradigm

Like all stories with significant ingredients of both architecture and technological innovation, the story of mass production should in fact start with Joseph Paxton’s Crystal Palace in London 1851. A non-residential project that showed Paxton was way ahead of his time. It took another half a century before characteristics such as repetition, modularity and standardization were going to play a significant role
in society and drew widespread attention of designers and architects. It is in fact logic that architects got interested in car design. After all it was a technological advanced and new spatial concept: a autonomous moveable enclosed space.

Figure 3: Le Corbusier: Maison Citrohan 1920 (left) and Voiture Maximum 1928 (right).

Le Corbusier with his design of Maison Citrohan (1920-'22), was in fact the founder of the direct comparison and glorification of the automobile as an example for housing manufacturing. The name itself was a pun and a wink to the homophonous French car brand. He was the first architect who openly linked the production of houses to the production of cars. Already in 1925 he made the first steps in the direction of standardization with the Dom-Ino concept. In 1923 he furthermore propagates engineer-aesthetics in his Vers une Architecture, where he characterises the house as a machine à habiter (a House Machine):

“If we eliminate from our hearts and minds all dead concepts in regard to houses and look at the question from a critical and objective point of view, we shall arrive at the ‘House Machine’, the production house, healthy (and morally so too) and beautiful in the same way the working tools and instruments which accompany our existence are beautiful.” [5]

Le Corbusier literally compares classic buildings with car designs and points out their similarity. In powerful images he juxtaposes the evolution of the Paestum and the Parthenon (6th and 5th century BC) with a 1907 Humber cabriolet and a 1921 Delage ‘Grand Sport’ to illustrate the similar processes of refinement leading to ultimate beauty (Figure 5).

"Let us display, then, the Parthenon and the motor car so that it may be clear that it is a question of two products of selection in different fields, one which has reached its climax and the other which is evolving. That enriches the automobile. And what then? Well it remains to use the car as a challenge to our houses and our greatest buildings. It is here that we come to a stop.” (Le Corbusier, Vers une Architecture)

He elaborates his ideas in the design of the Pessac housing project (1927) and a car design Voiture Maximum (1928) and the Maison Maximum housing proposal (1929).
Designs by Richard Buckminster Fuller, the Eames couple and Jean Prouvé intensified the idea that housing systems and prefabrication are also architectural topics. Fuller with his 1927 designs of the Dymaxion House and Dymaxion Car was attracted, more or less like Le Corbusier, by the efficiency of cars. His design proposals appeal to dynamics plus maximum efficiency (= Dymaxion).

In the 1930’s cars were linked to the Modernist movement in architecture. Sometimes literally, like in the 1932 advertisement for Oldsmobile (‘Modern to the Minute!’), where the car was photographed in front of Richard Neutra’s Van der Leeuw Research House in Los Angeles.

The design approach of Charles and Ray Eames’s own house in 1949 was different and, nonetheless its overall importance, less relevant in this survey. They assembled the entire house from building components ‘off the shelf’. [3] [7]

After WWII the huge demand for affordable houses gave a great impulse to industrialization of the housing industry. Catalogue houses boomed and were partially and/or temporarily successful in the USA (Lustron 1950, [4]) and Japan. European attempts however mainly failed.
In the 70’s the mainly British High-tech movement glorified technology and engineers-aesthetics. Michael Hopkins for example developed his *Patera* building system in 1981 for factories and offices, aiming to result in a ‘T-Model’ kind of building, directly referring to the T-Ford. [3]

In 1973 Richard Bender wrote his legendary *Crack in the Rear-view Mirror*. [2] On page 131 Bender reverses the paradigm and describes the manufacturing process of a car as in a way that is ‘normal’ and generally accepted in the traditional housing industry. In an hilarious way he describes the laborious, time consuming and at times clumsy way the car gets designed and manufactured. The story ends, years after the initial sketches of the car were made, with the celebration of the final delivery and paying the lawyer’s fee. It shows how absurd and old-fashioned the design and realisation of a house in fact is.

### 4 Cracks in the paradigm

Several differences between cars and houses are of course obvious. Beside the superficial, there are also more fundamental differences between cars and houses that make the popular paradigm go faulty.

**Basics:** Housing is one of the vital necessaries of life, cars essentially are luxury products.

**Function:** Houses accommodate a wide range of aspects of living (working, eating, sleeping) while cars are more one dimensional.

**Dynamics:** Cars move, houses seldom do, so there is no need for aerodynamics and weight reduction. The sheet metal for cars doesn’t have any competition from brick.

**Batch-size:** The total issue of a certain car type is in the 100,000’s or more. Houses generally still are prototypes.

**Development:** cars had an accelerated surveyable evolution of about 100 years. Residential building has a gradual wide-spread complex evolution of over 5000 years.

**Life span:** the life span of cars is in the 10 years range. Houses (in the Netherlands) often have a life span of over 75 years.

**Design process:** Car designers are employed by the car manufacturing company itself. Architects rarely are an integral part of a contracting -, building - or housing company.

**Perception:** cars are consumer products. Houses are long-term investments. This is perhaps the bottleneck in the struggle of residential building to get industrialized. History has proven that this point of view is very stubborn and hard to change. [11]

**Flexibility:** The automotive industry has cultivated and sophisticated the idea of ‘optional standardization’. Numerous options (colours, engine, 3-5 doors, accessories etc.) within a single car type, result in so many different combinations that no two cars are identical. This concept is relatively new in the housing industry. (For example the Heiwo House of CEPEZED Architects. [8 – 11])

### 5 Conclusions and recommendations

Apparantly the differences between cars and houses outnumber the similarities. There is a certain coherence between all the aforementioned aspects. E.g.: the relative short life span of cars, has contributed to the idea of cars being consumer products. The enormous numbers of cars being produced legitimates the employment of designers in the car industry itself.

All in all houses are more complex than cars, not technically but socially and spatially. Therefore a full-scale translation of car-design and –manufacturing concepts to housing would be absurd. Though some aspects might be worth further research, like the concepts of ‘optional standardization’, ‘lean production’ and ‘zero-stock production’ in the housing industry.
The perception of time is essentially different for houses and cars. In the car industry revolutions are possible and accepted (space wagons, Smart), the housing industry tolerates only step-by-step evolutions.
Other aspects will have to be adjusted equally careful. One example is the idea of prototyping, an idea with two different notions in both worlds. The car industry makes models to learn from, to modify and optimize designs. In prototype houses, we live.

6 References and further reading