

Designing For Affordability

By pursuing all the three Es – Economy, Efficiency, and Evolution – from the automotive playbook developers and architects could perhaps uncover the holy grail of affordability.

28 April 2019

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As an engineer, it saddens me that the industrial revolution and the rapid cycle of changes it unleashed has passed home building by. Town planning and architecture, and construction of ‘modern’ homes, dates as far back as the Indus Valley Civilisation. As an industry it predates automotive by a few thousand years. Yet, it could perhaps learn a thing or three from its contemporary cousin where it comes to designing for affordability.

In less than a century since its inception, the automotive industry has taken giant strides in three important dimensions of affordability. Rapid technological advancements in materials and manufacturing systems have helped auto OEMs deliver the same for less (Economy). Product design has become more sophisticated, paving the way to offer more for the same (Efficiency). And the offering – product plus service – has kept in step with the changing and multi-faceted needs of the target users (Evolution).

Economy, or offering the same utility for less cost. We will soon be commemorating the two hundredth anniversary of the invention of Portland Cement. While various cementitious compounds had been used by the ancient Romans, Portland Cement fundamentally altered the course of the built environment across the world paving the way for mass and mechanised production of buildings. Since then, however, innovation in building materials has arguably been more incremental than radical. Concrete continues to contribute sixty percent by weight to a typical residential building. In sharp contrast, over a shorter span of less than five decades automobiles have been transformed from within by a rapid turn in materials including alloys, plastics, composites, electronics and rubbers. Today, as much as forty percent by weight of a passenger car comprises materials other than automotive grade steel (which itself has undergone major metallurgical improvement). In 1913, the Ford Motor Company rigged up the first rudimentary moving assembly line. A

rope pulled a vehicle chassis along a 150-foot 'line' where over 3000 parts of the Model T were assembled in 84 distinct steps by 140 assemblers. The new process crashed assembly time of each car from 12 hours to 90 minutes. Assembly line manufacturing has since been widely adopted across industries and yielded major benefits in throughput and cost. When it comes to home building, there has been some progress in mechanisation of construction activities with the adoption of material handling equipment and the invention of formwork systems. In recent years pre-cast construction and 3D printing are also getting much attention. Yet, these remain at the periphery and account for a small fraction of the total output of the building industry. Home building unfortunately still very much resembles a job shop rather than an assembly line.

Efficiency, giving the customer more for the same price. The relentless focus on cost reduction has opened the floodgates for auto OEMs to pack in many more features and functions in their products without significantly increasing price. Modern cars are more powerful, more comfortable, cleaner, safer and smarter than their predecessors of even ten years back. Perhaps the biggest leaps have been in powertrains and electronics. Car engines today are many multiples more fuel efficient, and the advent of electric and hybrid vehicles is blazing a trail towards a more sustainable future for mobility. Electronics and software now pervade every modern car yielding benefits in comfort, safety and maintenance. Some analysts expect software will comprise up to 30 percent of the overall vehicle content by 2030! Similar innovation has been seen in two aspects of home building – mechanical systems and lifestyle amenities. Plumbing, air-conditioning and elevators are relentlessly delivering more convenience, comfort, safety and economy. Residential developments today boast of a plethora of lifestyle amenities catering to health and wellness as well as entertainment and recreational needs of residents. Yet, there is very little innovation to show within the four walls of the home itself. Many would argue that the marked shift towards higher density urban developments, while a necessary response to an economic imperative, has more often than not come at the cost of functionality and comfort.

Evolution, the ability to offer more value to more customers. Car ownership, and indeed multiple car ownership, is now widespread and there is an inexorable trend towards owners wanting their cars to serve different needs at different times. How has the auto industry managed to deliver this variety while still keeping a lid on costs? Unarguably, the biggest contributor to affordability in auto manufacturing has been the approach to product development via platforms that lend themselves to multiple different actual products that are brought to market. In 2017, Ford announced its ambitious plan to shrink its product development scope to just five platforms globally. On these five platforms, they planned to launch up to two dozen

new car models and their attendant variants. This strategy was expected to help Ford increase the sharing of parts between car models from 30 percent to around 70 percent by value while still offering a wide variety of choices to its global customers. On the same dimension of modularity and standardisation, home building exhibits a split personality. On the one hand, developers and architects take pride in distinctiveness rather than commonality.

This has led to unbridled variety and complexity that many would argue contributes only marginally to customer value. In one project I recently reviewed I found over two dozen distinct window sizes being used, some of them varying in dimensions by less than ten millimetres! On the other hand, it strikes me as anachronistic that the basic layout of my childhood apartment built in the early 1960s is largely unchanged in the products we are building today. This is despite a marked shift in family structures (the number of nuclear households in urban India grew from 30 million to 42 million between 2001 and 2011), the time spent by various members of the family in their homes, and what they spend that time on. Sunday morning Ramayan on the television is no longer the communal activity it once was. In fact, media is increasingly consumed individually on mobiles, often in the privacy of the bedroom. Yet the family television continues to find pride of place in the architectural layout of the living room even today, coming at the cost of other perhaps more pertinent uses for the space.

Home ownership is one of the most deep-seated aspirations of Indian families. Yet it remains out of reach for most. Despite their best intentions, developers have been ineffective in breaking this conundrum. By pursuing all the three Es – Economy, Efficiency, and Evolution – from the automotive playbook developers and architects could perhaps uncover the holy grail of affordability. In doing so, they will unlock significant unmet demand. And transform the lives of millions of families. Wouldn't that be worth our life's work?

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