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# Building our future and the future of building: Challenges from an organizational-cultural viewpoint

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**Abstract.** Since the world was shaken because of the globally spread Covid-19 Pandemic, starting in late 2019/early 2020, many societies, including their businesses and sociological/behavioral systems, seem to be -and have been- influenced and -moreover- even been "shaken on their foundations". All around the world such related daily experiences have lead to reconsidering for example the way we live, how we work and how we relax.

Nevertheless, when focusing more into detail on the construction industry and their outcomes (buildings, infrastructure, etc.) it is challenging to see if the way the construction industry was organized still might be the way how it will be kept organized after the COVID-19 Pandemic; especially because it seems that the influence of the pandemic on daily lives and businesses is now gradually decreasing; at least in the western developed world...

This discussion-paper aims to analyse and reflect on construction processes, derived from experiences and practices within case-studies, related to the project-development of buildings, from an organizational-cultural viewpoint. And this is especially important not only because it has been proven that the "soft factors" are maybe even more important than the "hard" factors in construction industry, but -moreover- because construction is a people's business....and it will stay so, despite -or even thanks to- increasingly "data-driven" (i.e. behavioral) developments. Conclusions and recommendations are focusing on the future of building, being part of the construction activities that are used and/or needed to keep building our future.

## 1. Introduction

During recent and actual Covid-19 Pandemic the society has been -and is- fiercely hit. Not only from a human perspective, but also from a technological perspective. Think about the many victims who died or still suffer from the symptoms after having survived the pandemic. Or, from a more technological perspective, for example the delay in production supply chains because of shortage of materials. However, there are also more positive aspects, for example stimulating the creativity and speed of innovation because of the urgent need for solutions and/or change.

The technological development of products itself has been speeding up significantly, especially within the branch of medicine. Where normally medicine development takes technical and approval time periods of many years, despite accelerated processes of vaccine production, according Barker [1], for the Covid-19 pandemic development time periods have been reduced to approx. three to six months. Of course this might raise the question if previous long time periods were really needed and/or if actual short time periods are really leading to reliable and safe medicines, but these are aspects outside the scope of this paper.



Apart of the branch of medicine, other branches have increased their speed of development, too. Think for example about the increasing development of online meeting tools and the adjacent acceptance of “working from home instead of at office”. According the 2021 survey from Ozimek [9], the remote work is “changing business forever”, stating that since their previous survey of November 2020 they saw an increase of projected expectations, as follows: Within the next five years nearly 28% of their respondents expects to be working fully remote, whereas in their previous survey of November 2020 just 22,9% expected to work fully remote within the next five years.

Interesting about this is that is is not only about technological development itself but also about the acceptance by its users. When projecting this on construction industry, the user behaviour itself is an important theme; this paper will discuss more into detail this aspect.

## 2. The acceptance of technological developments within construction industry

Changes within technology used within construction industry often leads to acceptancy issues. Think for example about the following well-known questions and/or statements, often raised by stakeholder within construction industry:

- *Why should we do it different?*
- *Using the most innovative technologies makes us the best in class;*
- *Sophisticated technologies increases operational risks;*
- *What are the costs of it?*
- *Etc....*

...but also:

- *Using the most innovative technologies makes us the best in class;*
- *Introducing new technologies within our organization improves the attractiveness for young and talented employees;*
- *Our shareholders want to create shareholders-value, which is impossible to reach without modernization of the company;*
- *Etc....*

...or ‘simply’ moreover:

- *National and/or regional/global governmental regulations oblige industry to produce within ‘zero-carbon’ restrictions;*
- *Investors won’t buy products anymore (real estate, infrastructure...) if they aren’t produced according the latest sustainability standards and adjacent certificates;*
- *Etc....*

Altogether the human society develops towards a more sustainable future, and this not only within The Netherlands but also on a global scale; additionally the Covid-19 pandemic seems to become a serious “driver” for speeding up this development.

Especially within the field of “biobased” construction one can see increasingly efforts to make this more and more acceptable. Basic definition of “biobased building”, as being defined by Haas [5] and used within this paper, is as follows, and will be illustrated within this paper more into detail with some Dutch examples:

*“Biobased building” is a way of building that is based on nature. Usually we mean that construction is done with building materials that have grown. The definition can also be expanded with a language of form and technology based on nature; then we speak of “biomimicry”.*

### 3. Some Dutch examples of housing industry developments

Technological developments within construction often have failed to become accepted. Especially when it was rooted within “biological” developments, it often had the atmosphere of “alternative”, non-conformistic approaches, where only a small group of ideologists were open to accept these kind of developments. An early example of biobased building principles is the “MHP - Methode Holistische Participatie®”, developed in the mid 1970’s by Schmid [11][12] (and later analyzed by for example Czabanowski [3]), which was in those early days often considered to be a quite “alternative” way of thinking, making Schmid being one of the pioneers in The Netherlands in the field of sustainability within architecture and construction. However, gradually since the late 1980’s and early 1990’s it was accepted increasingly, because the interest (and need!) for taking more into account the influence of construction industry’s activities on the natural and living environment became a (or moreover, “the”) prominent theme within the sustainability theme.

And this seems to be what is increasingly happening now in The Netherlands. For example especially within the field of biobased building one can see increasingly efforts to make this biobased approach more and more acceptable.

Where since early history most of the building materials were made of stone/brickwork and since the 1900’s the increasing use of steel and concrete was clear, the use of wood for total housing/buildings was always a minority share of the total building-market; of course the use of wood for window-frames, roofs and floors was quite normal, but for the total construction of houses the use of wood for the superstructure etc. was not that common; only in the semi-permanent market (mobile units etc.) the use of wood was quite common. However, since the increasingly focus on for example themes like “decarbonization”, “cradle-to-cradle”, in early days described by Braungart and McDonough [2] and, not in the least, the increasing need for a large number of newly built houses, this altogether has lead - in the case of wood construction- to a kind of “revolution” within the Dutch housing industry, as described by Van der Lugt and Harsta [16]. This not only from a governmental (regulations) viewpoint, but also from a contractors’ (production) and users’ (living) viewpoint.

Nevertheless, not only the industry for producing wooden buildings is increasing; also other market segments like for example concrete and brickwork buildings are still being produced. For example within the concrete and brickwork housing industry several producers -often part of large industrial conglomerates, active in construction industry- are also increasing their production facilities, merely based on the projections for increased housing demand between 2020 and 2030, where there is an expected demand for approx. an additional 845,000 newly built houses, according projections of the Dutch government, the Rijksoverheid [10].

An example for this since ca. 2016 is the Dutch “MorgenWonen®” (here translated as “Living Tomorrow”) housing concept, especially focusing on prefabrication and speeding up of the total production process, as described in for example Het Financieele Dagblad [6].

Another Dutch example since ca. 2020 is the “Fijn Wonen®” (here translated as “Nice Living”) housing concept, for which a completely new production facility including robotic production units has been built in The Netherlands, as described in for example Het Financieele Dagblad [7]. These kind of “modular” housing systems are nowadays supported by the improving information technology, for example with web-based platforms and data-analysis tools.

Nevertheless, such approaches did already exist earlier in for example the 1980’s, then often called “brochure plans”.

An early and innovative Dutch example from the mid 1980’s was the so called “Het Tijha Plan®” for individually built single-family houses, developed by Tijhuis and Bakker [13]; however, production-method of these housing units itself was still quite traditional, which was also the focus of the foreseen clients group, who specifically preferred “handmade” individually produced houses instead of “robotically” produced serial houses, but with standardized (i.e. cost-efficient) modular elements.

Altogether, one can see that parties inside and outside the Dutch construction industry are increasingly investing in, and more or less betting on, a strong increase of production capacity, to

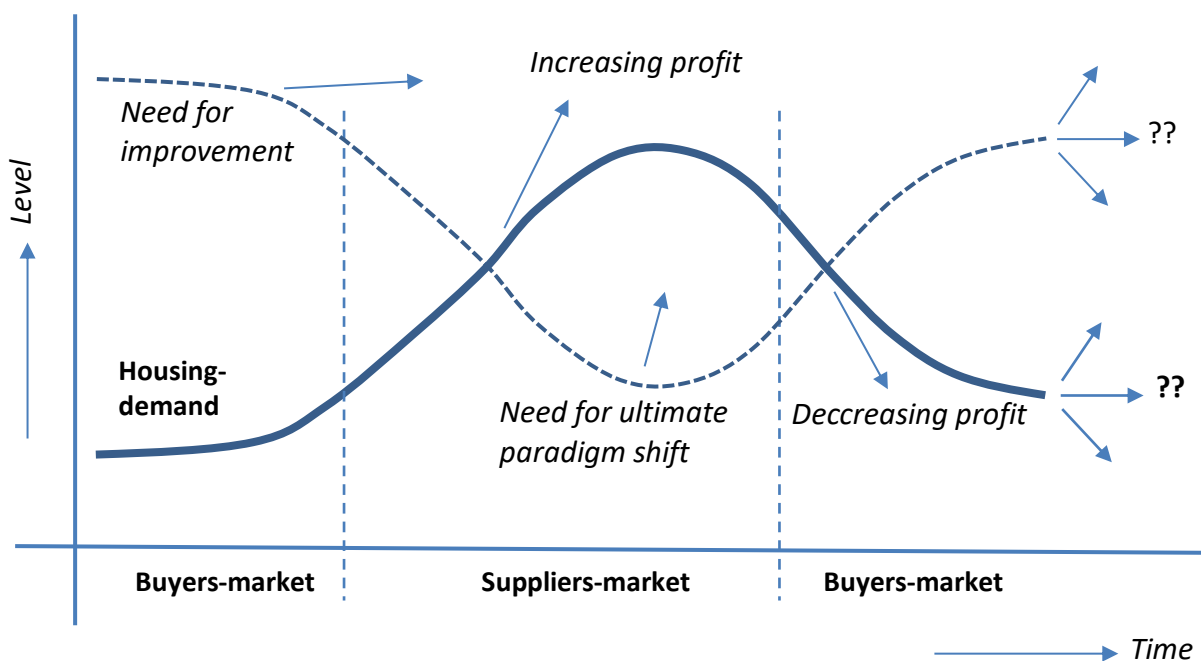
fulfill the actual and future projected increasing demand for newly built houses. This despite the also still existing situation of quite complex public procedures for urban development and for obtaining building permissions, which are seriously delaying the speed of realization and delivery of those foreseen new houses.

#### 4. Changing stakeholder's behaviour: A people's business

The described examples of developing and applying new technologies within construction industry do not only support the need for newly built housing units, but also imply that clients/end-users will have to be willing to accept these kind of new approaches. Altogether this still stays one of the most important aspects, because organizations within the (actual) supplier-oriented market should not only consider this market status, but also be prepared for a future (probably more buyer-oriented) market. However, this is often a dilemma, i.e.:

- In times of a suppliers-market, there can be generated generous profits in a growing market, but the need for improvement decreases somehow, often questioned by organizations as follows: *"The business is going forward, so why to improve?"*;
- Nevertheless, when the markets shrinks, turning into a buyers-market, the organization should already be fit-for-purpose, thus being able to adapt instantly to the new market-situation; but that improvement should already have been made before this new market-situation emerges, often referred to the following: *"Repairing the roof when the sun is shining"*.

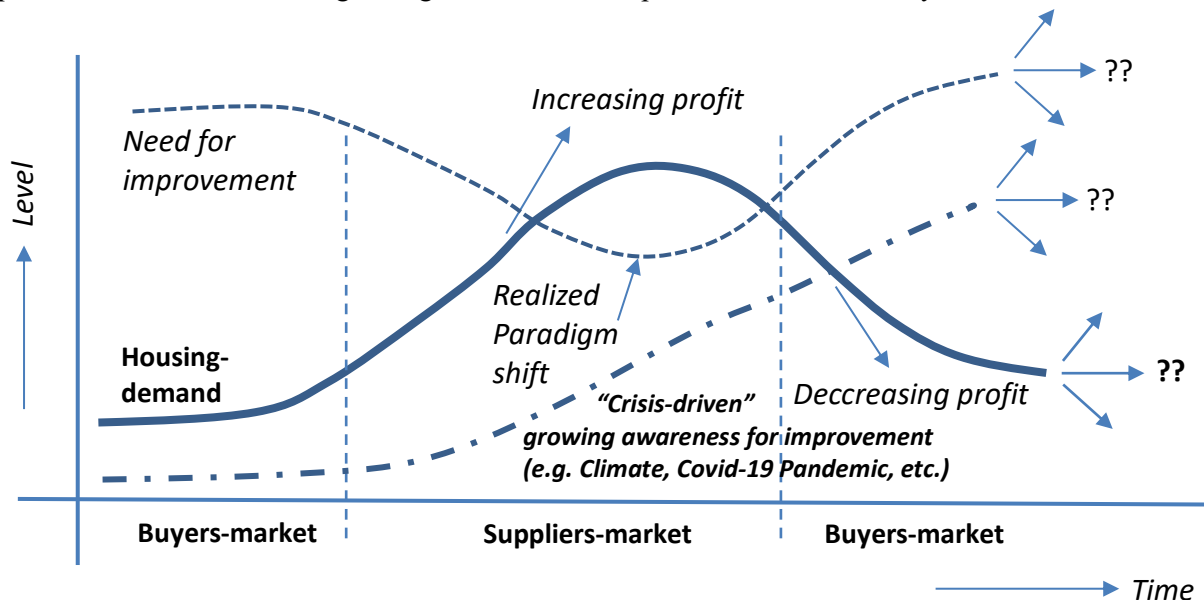
Figure 1 represents this relationship between "market-dynamics" and "improvement-dynamics" schematically.



**Figure 1.** Market-dynamics related to improvement-dynamics.

These dynamics do need to be tackled by organizations within the construction industry, which do need to be and to stay aware of the market and their stakeholders within. Especially since recent Covid-19 Pandemic it seems that the need for change of economy and society has become very prominent, also because society has seen that things can't go on like it did before (think about for example habits of greeting by hugging, etc.), and economies have seen a global shortage of resources within supply-chains (think for example about shortage of building-materials).

Adding actual themes like for example the climate-discussion to this, the push and need for “transition” of society and economy (and for example the organizations within) has become very actual. This has for example in Europe lead to a huge support from European Commission and national governments in supplying sufficient public funds to keep society and economies “alive”, and initially pushing the “innovations” to a structural higher level than usually expected. Figure 2 represents this “crises-driven” growing awareness for improvement schematically.



**Figure 2.** Market-dynamics and improvement-dynamics, influenced by crises like for example climate, Covid-19 Pandemic, etc.

One of the challenges is now to keep this “momentum” of growing awareness about the need for improvement, also if and when crises-times (climate, Covid-19 Pandemic, etc.) are decreasing and conquered with (innovative) medicines, etc. If projected on construction industry, it is important then to keep the different parties alert and behaving with an innovative attitude, to stay prepared for undoubtedly coming next crises times.

## 5. Organizational-cultural influences within construction improvements

A continuing improvement approach is not that easy to maintain in society and economy. Especially when times are getting better, there is a risk that people might think that it is unnecessary and are starting to slow down innovation-processes. From the viewpoint of behaviour this is not that strange, and can be seen on many moments in history. Think for example about the moment when big oil reserves were found and, following this, the development of oil-driven engines speeded up, by which the need for oil increased, leading to a strengthened search for new locations. Since approx. the end of the 1800’s these developments were “fuelling” the further industrialization, and meant the end of the steam- and coal-era. And although in the early years after oil-discovery most of the parallel discovered gas was simply “burnt away” because there was no real vision nor technology what to do with this highly explosive new product, it nowadays is a very important source of energy, parallel to oil. In fact, many countries alongside the so called “silk road”, for example Kazakhstan, Turkmenistan and Azerbaijan, are still in the phase of scaling up their oil and -especially- their gas exploration activities, as described by for example Frankopan [8], whereas other countries like for example The Netherlands are strongly decreasing their gas exploration and are even focused to end it completely within the next years; this especially because the public opinion has turned against it due to the increasing damage to housing and other buildings, because of an increasing number of -quite serious- earthquakes in the area, caused by the approx. 75 years of gas exploration, according for example DutchNews [4].

This altogether makes it clear that the way how parties do react instantly within their (professional) circumstances makes it still quite difficult to predict, although one of the most interesting moments to compare and to analyze (professional) behaviour are “conflicts”, i.e. situations in which one cannot stay in-active but one must react, because of the (often negative) consequences if not taking action. See for example the often used method within for example corporate anthropology, where business/organizational cultures are analysed, often during conflict-situations. This approach was also used by Tjihuis [14] during his research within international construction industry, comparing Dutch and German construction processes, which has led to the development of the so called “3C-Model™”, and -several years later- by Tjihuis together with Fellows [15] further “translated” to other countries by analyzing several different case studies.

Interesting and still also quite threatening in this is the growing influence of social media tools with their strongly data driven approach (for example by their back office with track & trace tools, etc.), which try to predict and even influence human behaviour very much, making it increasingly easy for parties to “steer” the human (consumer) behaviour.

## 6. Discussion

The “new reality”, learnt for example by crises like the Covid-19 Pandemic, has turned the attendance of society increasingly away from less important themes towards “the” important theme of human mankind, i.e.: “Surviving”. And despite the fact that many poorer countries do have less opportunities to acquire sufficient medicines/vaccines, compared to the richer countries of this planet Earth, in general there seems to become a kind of ongoing “reset” of society, stimulating to take better care of for example environmental themes like sustainability, energy-transition, etc.

From this viewpoint the recent and actual crises more or less do have a certain “positive effect” on an attitude of increasingly (global) awareness for “it’s now or never”, if looking to the need and initiatives for taking action towards a healthier way of living and preserving nature and its resources.

Especially within construction industry this seems to become “the” norm, if considering actual West-European (Dutch) situation. And although “the” best solution to prevent for further (environmental) crises is still not found, the positive aspect is that thinking and acting within construction industry with a serious care for environmental and health aspects is not considered to be “an alternative way” anymore, but becomes increasingly “mainstream approach”; especially also because for example nowadays end investors and/or end users of projects are increasingly demanding/selecting their projects within very restricted boundaries, thus stimulating construction industry to fulfill those demands. It is now construction industry’s turn to give answers by taking up those challenges, where (behavioural) data is increasingly becoming the “new gold”; however with the awareness that “construction still stays a people’s business”.

## 7. Conclusions & Recommendations

### 7.1. Conclusions

1. Crises times should not just be considered as negative, but should for example also be used to improve the business organization and create new business approaches.
2. Within construction industry, data gradually becomes the “new gold”; nevertheless stay aware that construction industry still stays a people’s business.
3. Because of the fact that human behaviour can be analysed very well during conflict situations, actual crises times are becoming a huge source of new knowledge, useful for future development of new technologies and improvement of existing technologies.

### 7.2. Recommendations

- a. Construction industry needs to keep awake and aware of possibilities to improve themselves; not only during crises times but especially also in the period thereafter.

- b. The human factor within construction industry should still be valued preciously, because especially human beings instead of machines can add creativity to improvement-approaches.
- c. Listen carefully to what clients want; this seems quite logical, but it is nevertheless still necessary to keep in mind, because success in business creates the risk that organizations become increasingly deaf for their clients (weak) signals.

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