

Aarhus School of Architecture // Design School Kolding // Royal Danish Academy

'Ownership' versus 'smartness' of technologies

Unterrainer, Walter

Published in:

Perspectives on Technology is the answer - but what was the question?

Publication date:

2016

Document Version:

Other version

[Link to publication](#)

Citation for published version (APA):

Unterrainer, W. (2016). 'Ownership' versus 'smartness' of technologies: Three examples of integrative versus technocratic approaches to a spatial challenge. In W. Unterrainer, & A. M. Boye (Eds.), *Perspectives on Technology is the answer - but what was the question?* (pp. 22-34). Arkitektskolens Forlag.

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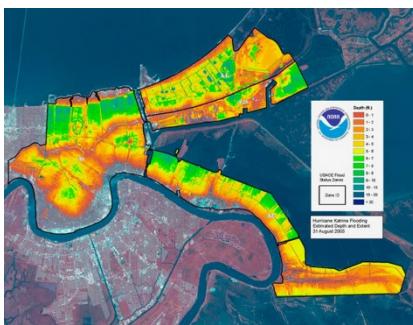
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‘Ownership’ versus ‘smartness’ of technologies

Three examples of integrative versus technocratic approaches to a spatial challenge

1

New Orleans after Katrina, an extreme storm, a ‘monster storm’: US Universities have simulated that even if Katrina had only had half its strength it would have resulted in the same area of flooding. After 1960 people were building settlements in areas where over 150 years it was considered as crazy to live – only relying on dams which were built up to four meters high.



Map of New Orleans. The green, yellow and orange areas were not settled before the 60's

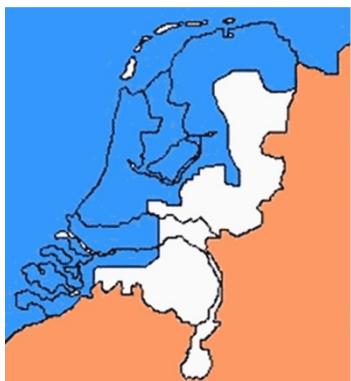


concrete dam in New Orleans

When being built, it was not calculated that the ground of the swampy coast-line is sinking between 6 to 35 mm every year. So when Katrina happened, the dams were effectively up to one meter shorter in relation to the sea level compared to when they were built. The dams were built by the most 'advanced' technology with high tech concrete, developed and constructed in collaboration with the US army. And that was another serious problem: all building materials corrode and all buildings need maintenance. Special technologies can only be maintained by specialist and that is expensive so there is a general tendency to postpone maintenance again and again. When Katrina came it was too late and the dams broke as well as they collapsed by undermining their foundations. Large areas were flooded with the result of 1836 death and enormous destruction.

If this example might illustrate that it is a bad idea to rely on technology, this is not necessarily the case: In the Netherlands, without the technologies of dams and other water fortifications, two thirds of the country including 12 million people would be under water. But there are decisive differences to New Orleans: The Dutch have a long experience and they started reclaiming land from the sea in the Middle Ages, then with windmills pumping the water. Nevertheless, in February 1953, there was a catastrophic event when an extreme winter storm in rare

combination with a spring tide resulted to a water rise over night of 5, 5 meters with the effect of 1800 dead and huge destruction. Shortly after that event, the so called 'Delta commission' and the 'Delta Plan' were installed and also new dams were built. The difference to the concrete walls of New Orleans was that they were built with the experience of centuries. And they did not rely on dams alone which are never 100% water-tight, they connected dams with other topographic solutions. But most important: their dams were built with materials found on site like sand and earth and by local workforce.



Map of the Netherlands.
Without dams and polder
dikes, the country had only
the size of the white surface



agricultural landscape in Holland with
dams and polder dikes

Every farmer knows how to build a dam and every Dutch child learns to understand that the country depends on

these constructions, also how to observe them and how to be aware about irregularities. The people have ownership of the technologies and people are part of the control and never ending maintenance. This is the crucial difference to technocratic protection systems – in Holland also creating agricultural productive land and beautiful landscapes for tourism. It is well understandable why Dutch have the saying that ‘god created the earth but the Dutch created Holland’.

2

A second example is the global problem of sanitation: according to WHO 2,6 billion people live without proper sanitation, in India alone resulting in 800.000 fatalities by diarrhoea every year, most of the victims below 5 years old. This is a humanitarian scandal.

There are historic similarities to the situation of European cities: big outbreaks of cholera in 1832 and 1854 lead to evidence by John Snow (a medical doctor in Soho) that the cause of the disease was polluted drinking water. It took more than 20 years and many thousands more dead people till the elites accepted Snow’s theory – maybe a similarity how scientific evidence of environmental risks nowadays is handled by many politicians. Finally, the city started building sewage systems, disconnecting faeces from the urban water fountains. The upcoming water

closets were a technological and hygienic progress of its time, with the paradox that for the sake of clean drinking water, drinking water was deliberately mixed with faeces for flushing into a distant river and much later into sewage treatment plants.



Building of sewer in London
Fleet Street around 1885



a space in Dharavi/ Mumbai 2013

For obvious lack of space and financial resources, individual toilets are no short term solution in countless informal settlements, where like in Dharavi/Mumbai an average of six persons share a space of 12-15 m². Jockim Arputham, the UN representative of slum dwellers started a lecture by saying 'architects don't know how to design a toilet'. He proved his provocative statement by

presenting non usable communal toilets designed in a technocratic way, badly lit and badly ventilated, smelly, dirty and unhygienic places with lack of cleaning water. They were rather settled by stray dogs than being useful for humans. In contrast, the author joined study trips to community designed toilets which were not only literally the cleanest areas in this overpopulated urban hybrid but also meeting places and information hubs for dwellers. The community collectively decided the location and the conditions of the toilets: well ventilated with a lot of daylight, huge rain water tanks for cleaning, separate toilets for male and female. But first and foremost: by a small monthly fee paid by all community members, a toilet cleaner is paid who lives with his family on top of the toilet.



clean community
designed toilet in Dharavi



terrace of the apartment of toilet responsible

This family has a privileged and generous apartment, even with the luxury of a large terrace in this extremely dense settlement. The only access to this flat is from the inner courtyard of the toilet, meaning the family would never get any visitors or lose all social contacts in case this access is dirty or the place is smelly because of lack of cleaning efforts. Building- and water collecting technology was applied, but all this would not work without this spatial concept that leads to immediate responsibility and without the context of communal ownership.

This could be an encouraging example for us to 'reinvent' sanitation and to question how to turn tabooed 'human waste' and faeces into a resource for growing food and energy production, establishing a new type of 'nutrient cycle' without risking hygiene or endangering the quality of drinking water.

3

Do we need machinery and air-condition for cooling or heating every room to provide thermal comfort? How come that supposedly climate responsive shading elements turned into caricatural shelves for air conditioning in such famous buildings like Le Corbusier's Chandigarh?

Both have to do with ignorance to the lessons of historic architecture, which itself was based on understanding the comfort of vernacular buildings. In climate zones like Chandigarh, shading of single glazed openings is needed but not good enough; it needs also prevention against the



a common picture in many cities:
each room has an AC machinery



Chandigarh Secretariat Building
Le Corbusier 1953

accumulation of hot air and heat radiation from outside the opening which is a result of solar heated thermal mass of the concrete elements.

In Palladian villas, representative spatial effects of domes were connected with comfort requirements of these rich villa owners: sophisticated airstreams and cross

ventilation systems, controlled air entries carefully designed down to detail, where hot air can ‘escape’ and therefore avoiding the hotspots outside openings in hot climate. Palladio did not invent these principles; he was



Villa Rotonda, Vicenza
Andrea Palladio 1592



cool air inlet for cross ventilation
below external stairs with opening
against heat accumulation

studying them in vernacular Italian architecture. For us again there is still a lot to learn from vernacular and historic architectures by avoiding romantic or decontextualized banal copies of the past.

How ‘smart’ are so called ‘smart buildings’ in reality? Is it a ‘smart’ and a sustainable perspective to go for more and more, more expensive, more complex and vulnerable technologies or is it a better perspective to strive for passive technologies in context to appropriate

design, which is understood, well-liked, manageable and controlled by the users?