

A Holistic Thriving Design Approach

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ABSTRACT

According to the Brundtland Report in 1987, Sustainability is to “meet the needs of the present without compromising the ability of future generation to meet their own needs.” This definition suggests maintaining the status quo, limiting damage, and protecting existing resources without addressing any leap, growth, or innovation. Unfortunately, the most popular word associated with social, corporate, and individual responsibility nowadays is about not ruining it for our children, as if less bad would be good enough.

By contrast, according to strategist Ralph Thurm, “ThriveAbility” is the sum of Sustainability and Innovation. “ThriveAbility” goes beyond collecting points for sustainability evaluation program certifications, beyond specifying recycled or renewable materials, and definitely beyond mere guilt management. We shall aspire to thrive with the transcendental knowledge passed onto us, with research and development, with creativity and imagination, and rethink the way we create products and our living environments. “Thriving Design” starts from the very beginning – when we first conceive a product or a building or a neighborhood, we shall consider beyond how it is designed, constructed, used, and paid for, also how it is maintained, repaired, retired, and recycled. This is a true holistic design approach to the life-cycle of the hardware and living environments to optimize materials and energy consumption, to produce no waste, and to create lasting values.

For Thriving Design to become a reality, we also need supportive governance, rules and regulations, distribution channels, and affordable pricing structures for the mass market. Thriving Design intricately intertwines with the financial aspects of the ecosystem. One has to be both an idealist and a realist. If we could demonstrate long term benefits and quantifiable savings, the market would tip favourably towards the holistic approach. Guilt management would not be needed, as following the trend would simply be the smartest decision.

Keywords: *design process, green ethics, green economics*

1. INTRODUCTION

According to the Brundtland Report to the General Assembly of the United Nations in 1987, “sustainability” is to “meet the needs of the present without compromising the ability of future generation to meet their own needs.” (Brundtland, 1987). This definition suggests maintaining the status quo, limiting damage, and protecting existing resources without addressing any leap, growth, or innovation. Unfortunately, the most popular word associated with social, corporate, and individual responsibility nowadays is about not ruining it for our children, as if less bad would be good enough. William McDonough and Michael Braungart, co-authors of *Cradle to Cradle*, ridiculed the use of vocabulary such as reduce, avoid, minimize, sustain, limit, whereas none of these “actions” halt resources depletion and destruction, only slowing them down, allowing them to take place in smaller increments over a longer period of time (McDonough et al., 2002).

By contrast, according to environmental strategist Ralph Thurm, “ThriveAbility” is the sum of sustainability and innovation. “ThriveAbility” goes beyond collecting points for sustainability evaluation program certifications, beyond specifying recycled or renewable materials, and definitely beyond mere guilt management. We shall aspire to thrive with the transcendental knowledge passed onto us, with research and development, with creativity and imagination, and rethink the way we create products and living environments. Thriving Design starts from the very beginning – when we first conceive a product or a building or a neighborhood, we shall consider beyond how it is designed, constructed, used, and paid for, also how it is maintained, repaired, retired, recycled, and re-used. This is a true holistic design approach to the life-cycle of the hardware and living environments to optimize materials and energy consumption, to produce no waste, to re-use resources, and to create lasting values. The idea echoes the concept of “Cradle to Cradle”: to consider waste as food, nutrients, and raw materials for new products (McDonough et al., 2002).

2. THE CONVENTIONAL PRACTICE

Out of all hardware produced in the world, one can hardly disagree that the most expensive commodity we make are buildings and infrastructure. Electricity consumption in buildings tops the greenhouse gas emission chart in the U.S., roughly 40 percent of the total national emission, making the Architects and Engineers the de facto professionals most responsible for energy consumption and pollution (Friedman, 2008). The calculation estimated emission during the operation of buildings and have not taken into account the resources consumed in the construction of new buildings, often in large material quantity with significant wastage; and the demolition of old buildings, often resulted in substantial construction wastes that end up in incinerators and landfills.

At present, majority of buildings are still designed and constructed in conventional “Cradle-to-Grave” means where “resources are extracted, shaped into products, sold, and eventually disposed of in a ‘grave’ of some kind.” (McDonough et al., 2002). We still specify conventional building systems and construction methods because they have been proven to work. However, one cannot blame all problems of pollution, waste production, and wasted energy on Architects and Engineers alone. How often have Architects come up with green ideas or Engineers propose renewable energy systems and got humbled by project managers in budget meetings? The fancy term “value engineering”, by eliminating green design and systems, meant that owners do not see the value of such green design and systems outweighing their initial capital costs. Ultimately, Architects and Engineers’ services are commission-based to design, coordinate with the project team, work with main contractors, and bring the owners’ visions to reality, but they do not have the final say in decision-making. There is a financial component in any design and construction projects often more significant than any other project criteria and goals because material and labour costs are very high, lands are expensive, and owners’ ultimate intention is to increase the value of their property and maximize returns on investments. Our challenge is to prove, using empirical evidence, that a holistic Thriving Design approach is more profitable in a long run. If we could demonstrate long term benefits and quantifiable savings to owners, the market would tip favourably without our need to advocate.

3. THE PROBLEM WITH THE STATUS QUO

Let us examine the common design and construction practice. For projects large or small, project phases more or less follow a linear timeline from conception to completion. Figure 1 illustrates a Typical Design and Construction Phase Flowchart. Consultants are usually engaged from Pre-Design when all parties discussed project goals, contractual terms and conditions, design fees, etc., to Final Completion when defects were rectified and the project is completed such that owners can occupy the building for the intended purpose. The duration of work phases are often clearly defined so owners would relieve consultants' liability when defects are rectified and warranty expires, and would not need to continuously engage the consultants for additional fees beyond contractual terms.

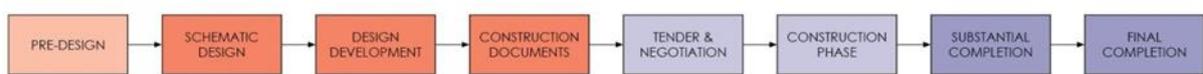


Figure 1: Typical design and construction phase flowchart

There are only so many pre-destined fates aging buildings would face. For the ones with some cultural or architectural significance, they might be rated historical monuments and would be preserved. Majority of buildings share the same fate in demolition when they aged and deteriorated to the point they no longer serve a functional purpose or generate justifiable revenue. While it takes years to design and construct buildings, demolitions are often optimized to squeeze out the last dollar of rental income, or exploded to rubbles within seconds in true Las Vegas style. The implosion of building produce plumes of smokes and tons of construction waste, sometimes enjoyed by the shouting and cheering crowds as another entertaining spectacle. The original consultants are long gone and long forgotten as their services are not needed in destruction, which is the antonym of what the team does.

Locally in Hong Kong, although less dramatic and more time-consuming, buildings are demolished for the same purpose of making ways to more valuable and profitable future. Daily construction waste generated in Hong Kong tops 4,000 tons per day and which would be moved to public filling reception facilities, sorting facilities, or landfill sites in Tseung Kwan O, Tuen Mun, and Sheung Shui. To emulate common practice in other first-world economies, Hong Kong government developed a “Polluter Pays Principle” years ago such that waste producers would be

charged for their disposal. Certainly, the charging scheme brought in extra revenue for the government but the problem of waste management remained. Nothing has changed except “waste disposal” became an extra line item on the budget sheet. There is zero innovation in the policy and it did not reduce waste significantly.

Other than promotion with nice slogans and taglines, there had been limited public or private revolutionary recycling program that make substantial impacts in waste management. Besides, “recycling” is probably the most abused and misused word nowadays as most of the claimed recycled products are in fact downcycled, meaning the process of converting the materials actually reduces the quality of such materials over time (McDonough et al., 2002). Downcycled materials contain less quality, less nutrients, and less properties of their previous lives while more energy or chemicals were added to make the materials useful again. We often forget to ask: how clean is the energy that was injected to making of the claimed recycled products?

4. THE WAY FORWARD: FIVE KEY CRITERIA

A holistic Thriving Design approach for the design and construction industry calls for a complete new paradigm in reconsidering the fundamental concept of building, recycle materials, use and comfort, and waste. The revolutionary design approach shall include but not limited to the following five key criteria.

4.1 Think of building as a system, not a structure

Paulo Coelho wrote in his critically acclaimed novel *Brida* that in life a person can choose to build or to plant. He stated, “The builders might take years over their tasks, but one day, they finish what they’re doing... Life loses its meaning when the building stops.” On the other hand, for those who plants, “they endure storms and all the many vicissitudes of the seasons, and they rarely rest. But unlike a building, a garden never stops growing. And while it requires the gardener’s constant attention, it also allows life for the gardener to be a great adventure.” (Coelho, 1990). Thomas Friedman expanded the same idea in *Hot, Flat, and Crowded*, “when you start to think of building as a system, not a block of bricks, all kinds of things become possible. And just imagine all these highly efficient smart buildings being integrated into an intelligent Energy Internet, where each building’s flexibility is used to serve the needs of other buildings, not just its own.” (Friedman, 2008).

As a system, buildings can take in solar, thermal, gravitational, and kinetic energy and produce more than they consume, or through on-site filtration plant to purify and produce effluents that are potable water. Buildings can have their own micro-systems to serve users and macro-system networked to share resources, to compensate one another due to differences in scale, use, foot traffic, siting, solar orientation, etc. In fact groundbreaking technologies are already out there but not commercialized for the market. We need an overhaul “creative destruction” with the “scrapping of old technologies and old ways of doing things for the new... to increase productivity and therefore is the only way to raise average living standards on a sustained basis.” (Greenspan, 2007) Similar to how light bulbs replaced candles, water heaters replaced boiling pots, fan coil units replaced fireplaces, new technologies are usually unpopular with a high premium when first introduced, but prove to be convenient, efficient, and cost-savings when the market matures. Construction industry must keep pushing cutting-edge technology to consider “building as a system for energy production” such that the “zero carbon building” is an obsolete concept, but “energy productive buildings” define the new norm.

4.2 Design beyond form and function

In a holistic Thriving Design approach, consultants cannot merely make design decisions based on form and function, also taking into account building maintenance and its afterlife. Thus, Architects and Engineers need to design not only the hardware, also the constructive process on how buildings are assembled as well as the reversal process on how they are disassembled when retired. The concept of “demolition” would be replaced by a new phase of “disassembling” to truly re-use and recycle the materials. Too often we have seen demolition in action and there are perfectly undamaged materials, products, furniture, sanitary-ware, ironmongery being dumped into the same pile. To tackle the problem of construction waste, charging disposal fees only license the guilt-free mentality and eliminating the source is the only effective way. Figure 2 illustrates a Thriving Design and Construction Phase Flowchart putting equal emphasis on the afterlife of the building and re-use what conventionally considered waste as raw materials for new buildings.

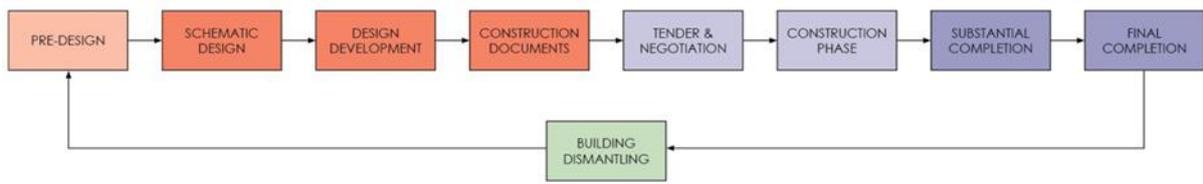


Figure 2: Thriving design and construction phase flowchart

Building Information Model, a.k.a. BIM, had been around for more than a decade and still being selectively considered by owners due to additional consultancy fees or misconception that their projects were too small in scale to justify the use. The strength of BIM is not in the “M” but in the “I”, therefore scale shall not serve as a factor to consider its benefits. While 3D model is for visualization of the built environment, it is the embedded parametric information and attributes that address construction means and methods. In a Thriving Design approach, the use of BIM is mandatory because everything could be constructed and simulated in 3D space, meaning we can foresee and eliminate problems during design and construction given a capable and prudent builder, streamline replacement materials and parts during operation, and anticipate the reversal process during dissembling.

4.3 Redefine our needs and manage our consumption

The shift from consumption to experience based lifestyle is not just fashionable, but a world phenomenon as consumers nowadays increasingly demand experiential or back-to-basics values across all commerce. We are now much more acutely aware of the importance of fundamental qualities of life and authentic lifestyles, including but not limited to genuine connection with friends and family, optimal consumption, organic and non-processed food, health and exercises, etc. As much as technology leap in recent decades, also the trend to appreciate simplicity and un-engineered lifestyles. The same shall apply to buildings and energy consumption.

According to Friedman, “energy efficiency was always the quickest, cheapest, most effective way to create clean power, because the best form of power is the power that doesn’t have to be generated at all because you eliminated demand for it.” (Friedman, 2008). Owners and project team shall take a step back and ask fundamental questions concerning use and comfort, spatial efficiency, optimal energy use, etc. Such deliberation may lead one to consider natural ventilation instead of overloaded air conditioning system, natural lighting instead of artificial, natural landscape instead of hardscape, etc. None of these passive design techniques are new or innovative, what needs to innovate is our mind in re-defining our needs and our sense of comfort. Currently most of the utility providers in the world calculate the required loading based on peak demand networking with redundancy system to minimize service disruption. Controlling our consumption not only alleviate the high demand, also the redundancy that often went to waste.

We also need to reconsider what constitutes “green building”. The true measure of a building’s impact to the health of the users and the environment stretches from its initial conception to design, construction, completion, and throughout operations. Unfortunately, most popular sustainability design evaluation programs nowadays including LEED and BEAM Plus certify buildings as “sustainable” purely based on decisions and actions made during design and construction process with no means to follow up with their operational performance for years to come. While a building might take several years to design and construct depending on its scale, average building life span nowadays is over 50 years with better materials, technology and techniques. The current practice is no different than stating a woman is healthy purely based on her conditions during inception and at birth, instead of a continuous evaluation or body checks throughout her lifetime. Earning a green certificate therefore paves only halfway of the road to true responsible design if not less. An unbiased and independent performance evaluation platform shall be in place to assess any new or existing buildings during their operations and such evaluation must base on actual energy consumption data collected from utility bills, metering, and users’ feedback. Management begins with measurement. With good policies and data transparency, owners and design professionals can work with utility providers who must measure consumption for billing purposes to evaluate the true energy performance of buildings.

4.4 Dream big and believe we are part of the solution

Environmentalist Paul Gilding once said, "How we respond now will decide the future of human civilization. We are the people we've been waiting for. There is no one else. There is no other time. It's us and it is now." (Friedman, 2008). Often times we got dejected by reality, by the budget-conscious owners, by the expensive green system prices that can hardly justify their life cycle costs. We shall remember, when the energy efficient and on-site renewable energy options provide clear financial benefits and rewards to owners who have long-term visions, the commercial market will tip and funding of further research and development would explode. In any revolution somebody has to play the role of a pioneer, to push, to advocate. We are the people responsible, right now. There is no one else, there is no other time.

To challenge ourselves in the spirit of thriving, we shall also consider how buildings, as systems, can upcycle their materials and components such that their intrinsic value worth more than their predecessors. Building owners and design professionals often see nature as the enemy, as it deteriorates and cracks the new look, the fresh coat of paint, the perfect alignments. In fact, nature is only doing what nature does without bias. Similar to how cedar wood ages and self-protects against insects, rotting, and temperature stress; or copper cladding and corten steel rust to become stronger and more aesthetically pleasing, Thriving Designers needs to explore, experiment, research, and develop new materials and methods that work with nature instead of against it, to consider nature and weathering as providers of fresh inputs and resources in the upcycling process.

4.5 Build rapport with the guardian and the commerce

Famed urbanist Jane Jacobs once described the two fundamental syndromes of human civilizations are the guardian and the commerce. The guardian is the government, whose primary purpose is to preserve and protect the public. The commerce is the everyday exchange of values between individuals, companies, and organizations in form of currency. While we shouldn't see nature as an enemy, individuals in the commerce also shouldn't see the guardian as one. It is the government's or the building department's job to be skeptical of new ideas and new standards, thus requesting substantial evidence or proofs or tests or internationally-recognized certification to validate the new as their core concern is public safety and common good. Once owners and design professionals recognized such parameters and rules of the game, we understand the challenge in executing Thriving Design and getting statutory approval hinge on our ability to demonstrate the add-values while maintaining public safety and common good as high priorities.

Most governments champion innovation with substantial public funding in technology and energy research, therefore we shall all be on the same boat. The challenge is that a government is not a single entity, but many subsidiary departments and they do not necessary work in synch. Consider it check-and-balances or otherwise, departments must protect their turfs and guard their interests in fear of making disastrous or careless decisions that jeopardize public safety. On the other hand, departments are often operating under pressure to innovate themselves. The process to build rapport with each and all of the subsidiary departments, along with industry leaders, manufacturers, users, and stakeholders to reach common consensus would be long and enduring, but worthy and necessary.

5. CONCLUSION

The dream of Thriving Design requires a complete change in our work habits and thinking such that we do not automatically assume the same design and construction practices repeatedly. Experience tells us certain materials and methods work, unfortunately experience is also one of the biggest obstacles in true innovation which often defies what had been done before. Charles Duhigg states in *The Power of Habit*, "A movement starts because of the social habits of a community, and the weak ties that hold neighborhoods and clans together. And it endures because of a movement's leaders give participants new habits that create a fresh sense of identity and a feeling of ownership. Usually, only when all three parts of this process are fulfilled can a movement become self-propelling and reach a critical mass." (Duhigg, 2012). Thriving Design approach is a movement in defying old habits of design and construction means and methods, it requires collaboration of professionals in their respective expertise as well as users and the public at large to share that common belief in thriving to bring this vision to reality.

Economist Jeffrey Sachs summed it up perfectly why innovation is the only way moving forward: “countries have a big market, further raises productivity and expands the size of the market, and creates new incentives for innovation. This momentum creates, in fact, a chain reaction, which economists call endogenous growth.” (Sachs, 2005). We need continuous growth for any economies and continuous innovation is about the only means to increase market size, creating what W. Chan Kim and Renee Mauborgne called the uncontested market places or “blue oceans” (Kim et al., 2005), raising the currency to enhance a larger market, which drives further innovation. Therefore, innovation and economic growth must be interdependent of one another, walking hand-in-hand, with a clear destiny for a better world. A holistic Thriving Design approach must be the path moving forward to build true thriving communities and living environments that protects the health and wellbeing of people while respecting the land and our finite resources.

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