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Extending the lifespan of buildings through adaptation

URBAN renewal has garnered much attention and debate of late on the Malaysian built environment. The urban renewal projects are focusing on old dilapidated high-rise strata properties in urban areas.

Whilst the nation is young, the majority of high-rise buildings are still relatively new and of low building age.

The urban renewal debate has missed out completely the intermediate phase of a building life i.e. the lifespan of a building from newly completed until demolition. During this building life cycle, building adaptation plays a significant role by providing various building use and occupation solutions and strategies at different phases of a building.

Generally building adaptation improves the physical building conditions to extend the life of a building. Specifically, building adaptation refers to a broad range of construction activities and interventions that modify existing buildings to improve their condition, extend their lifespan, change their function, or enhance their performance in response to new requirements, challenges, or opportunities. It's essentially about making an existing building suitable for evolving needs, rather than demolishing it and building anew.

The building adaptation concept is becoming increasingly important due to:

- **Sustainability goals:** Reducing embodied carbon (emissions from construction materials and processes) by reusing existing structures.
- **Economic efficiency:** Often more cost-effective and faster than new construction.
- **Heritage preservation:** Maintaining the historical and cultural value of existing buildings.
- **Changing societal needs:** Adapting spaces to new living arrangements, work patterns (e.g., hybrid work), or community demands.
- **Climate change:** Modifying buildings to be more resilient to extreme weather, higher temperatures, or increased flood risks.
- **Technological advancements:** Integrating new smart home technologies or energy-efficient systems.

Key aspects and types of building adaptation

While terms are often used interchangeably, here's a breakdown of common types of building adaptation:

1. **Extensions:** Adding new physical space to an existing building such as a new wing, an additional floor, or a basement conversion, to increase its capacity or accommodate new functions.

2. **Refurbishment/Renovation:** Involves replacing or fixing outdated components, remodeling interior layouts, or upgrading aesthetic appearances. It aims to modernize a building or improve its current use and appearance.
   - **Example:** Redesigning a kitchen, updating bathrooms, changing floor finishes, or improving a building's facade for a fresh look. Menara Standard Chartered (originally Menara Shahzan Insas) on Jalan Sultan Ismail has undergone major refurbishment to improve building appearance, updating technology (e.g. high-speed lifts, security systems), and modernizing tenant spaces to remain a Grade A office building in the Golden Triangle.

Rather than tearing down old high-rises, adaptation strategies can modernise structures to meet evolving market and societal needs. – ***PEXELS PIX***

3. **Rehabilitation:** Focuses on improving failing structures or components to bring a building back to a functional and safe state. The primary goal is to extend the building's effective life.
   - **Example:** Repairing a damaged roof, strengthening a weakened foundation, or updating an outdated plumbing system. Keretapi Tanah Melayu Bhd headquarters building, a colonial-era heritage building, is currently undergoing a physical rehabilitation/restoration project.

4. **Retrofitting:** Specifically refers to adding new elements or technologies to an existing building that were not part of its original design or construction. This often involves improving performance, especially in terms of energy efficiency or resilience.
   - **Example:** Installing new insulation, double-glazed windows, solar panels, smart HVAC systems to meet building sustainability requirements.

5. **Adaptive Reuse/Building Conversion/Repurposing:** This is a significant type of adaptation where a building's function is changed from its original purpose to a new one. The goal is to give an obsolete or derelict building a new life and prevent demolition.
   - **Example:** Converting an old factory into loft apartments, a historic school into a community centre, or a commercial office building into residential units. Central Market Kuala Lumpur (Pasar Seni/Pasar Budaya) is a very prominent and successful example of an adaptive reuse project. The building's original art deco facade was preserved, while the interior was renovated to accommodate modern retail spaces, a food court, and culturally themed zones.

   Rex KL, an old cinema in Jalan Sultan, Kuala Lumpur was converted into a multi-use cultural and community hub involving structural changes to create new levels and open retail spaces.

6. **Modernisation:** A broad term covering upgrades to bring a building up to current standards, technology, or aesthetic preferences. It often overlaps with renovation and retrofitting.
   - **Example:** Else Kuala Lumpur on Jalan Tun H.S. Lee was retrofitted and transformed from the old Wisma Lee Rubber into a luxury boutique hotel in 2022.

Criteria for building adaptation

Not all buildings are adaptable. A building suitable for adaptation would generally meet certain key criteria as shown below:

- **Convertibility:** Allowing changes in use that are economically, legally and technically feasible.
- **Dismantlability:** Capable of being dismantled safely, efficiently and quickly.
- **Disaggregatability:** Ensuring materials and components can be reused or reprocessed.
- **Expandability:** Allowing increases in volume or capacity when required.
- **Flexibility:** Enabling shifts in space planning through layout reconfiguration.

The building adaptation process typically involves:

- **Assessment of current condition:** A thorough evaluation of the building's structural integrity, mechanical and electrical systems, current performance (e.g. energy consumption), historical value, and potential for change.
- **Defining adaptation goals:** Clearly outlining what needs to be achieved (e.g. improve energy efficiency, change function, increase accessibility, enhance aesthetics).
- **Design and planning:** Developing architectural and engineering plans that address the goals, comply with building codes and regulations, and respect the existing structure.
- **Implementation:** Executing the construction work, which can range from minor upgrades to significant structural alterations.
- **Quality control and monitoring:** Ensuring the adaptation work meets standards and achieves the desired performance improvements.

Benefits of building adaptation:

- **Environmental sustainability:** Reduces waste from demolition, conserves embodied energy in existing materials, and lowers the carbon footprint compared to new construction.
- **Economic efficiency:** Often more cost-effective than building from scratch due to reduced material consumption, shorter construction times, and potential access to incentives/tax credits.
- **Heritage preservation:** Maintains the architectural, historical, and cultural significance of existing structures, contributing to community identity and placemaking.
- **Reduced urban sprawl:** Revitalizes existing urban areas and infrastructure, promoting denser, more sustainable development.
- **Faster project completion:** Can be quicker than new builds as foundational work and basic infrastructure are often already in place.
- **Community appeal:** Often generates strong community support by revitalizing neglected spaces and preserving local character.
- **Flexibility and resilience:** Creates buildings that are more adaptable to future changes in climate, technology, and user needs.

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