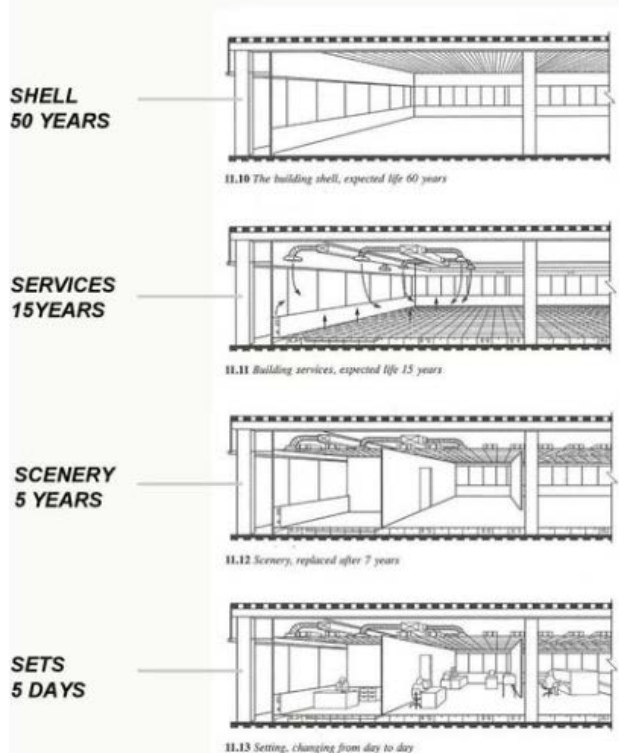


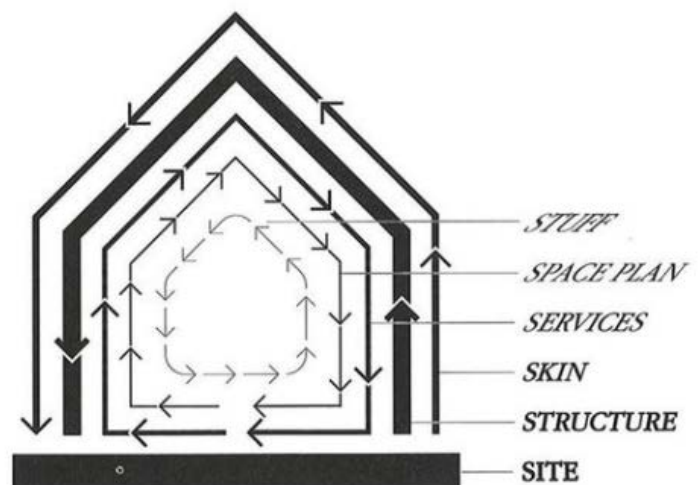
Construction Technology - Context

Within the context of what is referred to as Grade A office accommodation, apply the basic principles initially lauded by Duffey, F. and then Brand, S. (1994) and developed subsequently by many other authors of the concept of buildings as: Shell, Services, Scenery and Sets, discussing how this can contribute to 'whole-Life' building performance.

Buildings & Time



Shell, Services, Scenery,
Sets



Site, Structure, Services,
Scenery. Sets, Stuff

Shearing layers is a concept coined by architect [Frank Duffy](#) (FD), which was later elaborated by [Stewart Brand](#) (SB) in his book, [How Buildings Learn: What Happens After They're Built](#) (Brand, 1994), and refers to buildings as composed of several layers of change. The concept has been adopted by a number of technology vendors to also describe the different layers of systems within an organisation.

Description

The Shearing layers concept views buildings as a set of components that evolve in different timescales; Frank Duffy summarized this view in his phrase: “Our basic argument is that there isn't any such thing as a building. A building properly conceived is several layers of longevity of built components” (quoted in (Brand, 1994)).

The layers are (quoted from Brand, 1994):

Site

This is the geographical setting, the urban location, and the legally defined lot, whose boundaries and context outlast generations of ephemeral buildings. "Site is eternal." Duffy agrees.

Structure

The foundation and load-bearing elements are perilous and expensive to change, so people don't. These are the building. Structural life ranges from thirty to three hundred years (but few buildings make it past sixty for other reasons).

Skin

Exterior surfaces now change every twenty years or so, to keep up with fashion or technology, or for wholesale repair. Recent focus on energy costs has led to re-engineered skins that are air-tight and better-[insulated](#).

Services

These are the working guts of a building: communications wiring, electrical wiring, [plumbing](#), [fire sprinkler systems](#), [HVAC](#) (heating, ventilating, and air conditioning), and moving parts like [elevators](#) and [escalators](#). They wear out or obsolesce every seven to fifteen years. Many buildings are demolished early if their outdated systems are too deeply embedded to replace easily.

Space Plan

The Interior layout—where walls, ceilings, floors, and doors go. Turbulent commercial space can change every three years or so; exceptionally quiet homes might wait thirty years.

Stuff

Chairs, desks, phones, pictures; kitchen appliances, lamps, hairbrushes; all the things that twitch around daily to monthly. [Furniture](#) is called *mobile* in [Italian](#) for good reason.

Theory

The concept is based on the work of ecologists (O'Neill et al., 1985) and systems theorists (Salthe, 1993). The idea is that there are processes in nature, which operate in different timescales and as a result there is little or no exchange of energy/mass/information between them. Brand transferred this intuition to buildings and noticed that traditional buildings were able to adapt because they allowed “slippage” of layers: i.e. faster layers (services) were not obstructed by slower ones (structure).

The concept of Shearing Layers leads to an architectural design principle, known as **Pace-Layering**, which arranges the layers to allow for maximum adaptability.

Variations

The technology advisory firm [Gartner](#) uses the term pace layering in its variation of the shearing layer concept. They describe how within organisations there are different layers of software applications. Applications which need to adapt and change at different speeds. They refer to these layers as Systems of Record, Systems of Differentiation and Systems of Innovation. Their proposition is that firms need to look at how these application layers are governed, managed, sourced, maintained and interact to enable companies to better adapt and react to changing business requirements. Gartner have trade marked this variant/adaptation of pace layering in connection with how companies should manage their application portfolio, referring to it as the PACE layered application strategy (trademark).^[1]

Application

The Shearing Layers concept has also been applied to other man-made artifacts such as software (Simmonds et al., 2000;^[2] Papantoniou et al., 2003) or the web (Garrett, 2002).

In an FM WORLD INTERVIEW: FRANK DUFFY (CBE) AND PETER MCLENNAN (PM) DISCUSS (22nd of March 2012) the following (accessed at:

<http://www.fm-world.co.uk/features/interviews/fm-world-interview-frank-duffy-cbe-and-peter-mclennan/>.)

FD: *'There is also an ever irreversible logic in things that seems to be unfolding, which, funnily enough is being resisted by the supply side. I think there is a sharp division between those who like delivering what they are delivering and what society actually needs – not just office organisations, but people who now have choices about their way of life and where they work, how they work, whether they commute or not and how much time they spend at home.*

We have amazing opportunities to design different lifestyles and to invent a better sort of city, which are, to pick up one of the latest themes, based upon an understanding of the probability of where economically beneficial encounters are likely to take place. It might just as well be a Starbucks'.

PM: *'Starbucks will be very happy with you for saying that!'*

FD: *'Starbucks, I think, represents a particular moment of the office escaping from within the office building.'*

References

[Jump up ^](#) *"Gartner Says Adopting a Pace-Layered Application Strategy Can Accelerate Innovation"*. Retrieved 2016-10-19.

1. [Jump up ^](#) Simmonds, Ian; Ing, David (2000-03-20). *[A Shearing Layers Approach to Information Systems Development](#)* (Report). IBM Research Division. Retrieved 2016-10-24.
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