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Refurbishment of building components facilitating reuse - Beneficiaries recount

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Abstract

According to the National Trust for Historic Preservation, it may take about six to seven decades for an energy-efficient new building to save the amount of energy lost in demolishing an existing building. Hence retrofitting and reusing buildings may offer environmental and monetary savings over demolishing structures and rebuilding them. 'Increased environmental awareness' is the mantra of the modern world which entails that, rather than throwing away, users can increasingly be advised to practice recycling and reusing. This ethos is also being applied to buildings. This approach is called 'adaptive reuse'. It involves breathing 'new life' into existing buildings and carries with it sustained environmental and social benefits. Focussed planning and a sincere effort to practice the 9R's (Restore, Reduce, Renew, Recover, Recycle, Reuse, Rethink, Replenish, and Replace) in this context is gaining popularity and the resolution has roped in architects/interior designers in the wake to pacify businessmen and entrepreneurs to capitalise from such spaces.

Keywords: Refurbishment, Adaptive reuse, Sustainability

Introduction

Designing for adaptive reuse requires designing for the recovery of the majority of the building's components like exterior walls, roofs, foundations, decking, exterior skin, frames and so on. Planning and designing for recovery of the majority of the interior non-structural elements also is likewise required like the interior walls, doors, floor coverings, ceiling systems and so on. In short, designing buildings for purpose qualifying for adaptive reuse should ideally expose the 'building's structure to minor changes while undergoing major refurbishment'. The refurbishment of existing constructions today is indeed a promising activity. Many architects and builders had ardently taken this up as a major method of resolving environmental degradation. Here are a few notes of appreciation recommending the practice. It can be observed that the building industry is getting more devoted to these activities of consolidation, rehabilitation and modernization of old buildings state Mazzolani and Ivanyi(2002). Such projects entail giving outdated buildings a new purpose with upgrading and reconfiguration

that goes beyond the cosmetic opine Riley and Cotgrave(2011). It covers a wide range of activities, from relatively minor works to significant changes to the fabric or internal layout of a building. Refurbishment and modernization can effectively extend a building's life expectancy by 'resetting the clock' and this phenomenon plays a major role in the reusing and recycling of existing building(as opposed to demolishing), commonly referred to as 'adaptive reuse' address Wilkinson et al.(2009). The principal reasons for refurbishment as given by Gold and Martin(1999)are aesthetics, requirement to increase net lettable floor area, change in regulations, change of use and need to upgrade services. Refurbishment of a building always means adapting it to meet current standards, too, either because of changes in user demands or new technical regulations. The extent of building refurbishment will vary for each job and it is not possible to give definitive levels.

Materials and methods

Residences/houses are spaces where adaptive reuse and refurbishment have been in practice for long. Building obsolescence, cost of maintenance, dearth of labor and the like, force owners to part with traditional massive structures which the needy business tycoons are either ready to buy or rent for commercial purposes. Their need for an expanse of space in a proactive locality luring clientele has added the necessary pep to this type of contract. To decipher details on the profile of the establishments, type of adaptive reuse and refurbishment and processes followed, a field survey of the buildings that were reused was found necessary.

Coimbatore City which is famous as a 'business-hub', hence, was the broad locale selected for the study which houses many sophisticated commercial and residential buildings that have fallen prey to disuse for different reasons and have now become hotspot landmarks in recent years. In these areas lay the treasure houses needed for this specific study – Refurbished buildings which now serve different purposes satisfying the concepts of adaptive reuse. From a host available, 30 buildings which housed different firms that served different functions were selected for the study based on purposive sampling method. The personal interview method lent hand to enable the interviewer to collect necessary first hand data on the type and process adopted for refurbishment and adaptive reuse. The tool, an unstructured interview schedule, that requested details to judge the scenario of refurbished buildings and adaptive reuse of the building in use aided in the conduct of the study.

Refurbishment and adaptive reuse, though was in practice, has attracted attention as a major commitment to participate as responsible citizens in the environmental sustainability drive only in recent years. The investigator hence launched this micro level study to identify the various parts of existing buildings that can be reused to save time, money and energy; to analyse the trend in the type of adaptive reuse practiced in the City and to create a database on the various creative ways of adapting and reusing existing structures.

Results and discussion

The sample comprised of refurbished buildings put to different uses by different clientele. Attempts on refurbishment by the selected sample would definitely contribute considerably towards reducing carbon emissions. This section illustrates the scale of the building and its components refurbished by the selected sample.

1. Nature and Scale of Occupancy

One fifth of the sample firms were either owned or on lease respectively, but three-fifths were happily functioning in rented premises. Among the total sample, 60 per

cent were partnership firms followed by 33 per cent which were run by sole proprietors. Table 1 shows the relationship between the types of building, type of ownership and the built up area of each establishment.

Owned buildings were preferred by a majority of sole proprietors, while partnership firms preferred rented or leased buildings respectively. Corporate and government organizations preferred only rented spaces. The study brought to light the modern trend among entrepreneurs to show preference to refurbished spaces which enabled customization and adaptive reuse. Partnership firms that used buildings that were leased and rented had better potentials for expansion as these were the ones that had ventured in buildings of built up areas of more than 9000 sq.ft. and even upto 13,000 sq.ft. This advantage was restricted in firms that operated in owned buildings. Sole proprietorship stole the show in this group. Unfortunately, this group lacked multiple investors and risk bearers that featured in partnership firms. Hence maximum representation was in buildings with built up area from between 1000 - 3000 sq.ft followed by 3000 - 5000 sq.ft.

2. Refurbishment of Various Parts of the Building:

This section illustrates the building components refurbished by the selected sample on the following lines:

2.1. Refurbishment of Sub and Super-Structure:

All the samples retained the foundation and roof as of the original. Structural walls were retained by more than three fourth of the sample, and the envelope by more than one half. Almost 50 per cent had introduced a new ceiling by means of false ceilings, though 40 per cent was found to use the original one. Only a negligible proportion (10%) retained the existing flooring.

Table 1: Nature and scale of occupancy.

Particulars		Percent responding					
Type of Building (n=30)	Type of Organization	Built up area in 1000 square feet					
		1-3	3-5	5-7	7-9	9-11	11-13
Owned (n=6)	Sole proprietor (n=4)	75	25				
	Partnership (n=2)	50			50		
Rented (n=18)	Sole proprietor (n=4)	25	50	25			
	Partnership (n=12)	59	33				8
	Corporate (n=1)			100			
	Government (n=1)	100					
On lease (n=6)	Sole proprietor (n=2)		100				
	Partnership (n=4)		75			25	

Change was implemented either by completely replacing the old one with a better alternative (57%) or by installing a new component above the existing flooring by the use of vinyl and wooden floors (23%). Regarding partitions, a good 30 per cent had removed it completely, in order to enlarge space, while 43 per cent had introduced something novel to segregate areas where needed. It is clear therefore that all the samples had meddled with buildings that they had chosen for adaptive reuse, impressing upon the fact that 'Form follows Function'. Aesthetics, enhancing performance standards of functional space and defining maximum exploitation of space use effectively and efficiently were the objectives in carrying out refurbishment.

2.2. Refurbishment of Fenestrations:

Making ample room for natural ventilation and lighting and creating functional ambience and ergonomically designed spaces emerged as primary objectives of such refurbishment projects. While maximum door (63%) and window (73%) openings were retained by the sample, the others had introduced a few openings (7%) to enable entry of more air and light and removed or concealed a few for privacy, HVAC purposes and kinetic systems. Existing doors were replaced with better alternatives by a maximum of 40 per cent of the sample; existing windows, on the other hand were retained by 53 per cent.

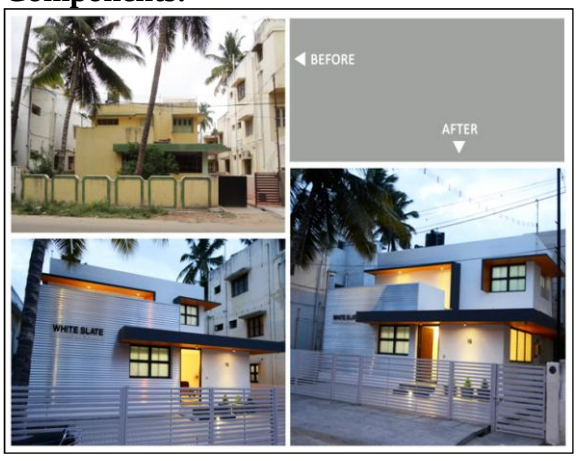
2.3. Refurbishment of Service Components:

New electrical and plumbing lines were laid satisfying current requirements and uses by 70–90 per cent of samples. While 91 per cent of the samples had made provisions to install new HVAC equipment as the old buildings did not have the required provisions, 93 per cent had replaced all the existing sanitary equipment with better alternatives to enjoy technical advancements, honoring the availability and ease found in the fixtures.

While 27 per cent of the sample retained the existing stairs, 17 per cent had made a few repairs that were required to be made to keep them strong, safe and beautiful. Forty per cent of the sample operated on a single floor hence nothing regarding stairs or elevators concerned them. Security systems being a necessity of the recent times and because existing buildings did not have such systems, 70 per cent had introduced security and surveillance systems like alarms, CCTV cameras and smoke detectors.

Safety, security, ease of work and mobility and providing an enabling environment through artificial lighting and ventilation had been the target behind such ventures. Introduction of intelligent/smart systems as a 'value addition' measure is visibly made evident through such refurbishment.

2.4. Refurbishment of Aesthetic Components:



The façade of any building is like a cover page of a book that embodies the type and use of the building; it was hence repaired or renewed by 47 per cent who preferred the heritage look and replaced with better options by 23 per cent of the sample as in Figure 1.

Table 2: Refurbishment for extension and conversion.

Particulars			Extension required-room/balcony/portico Percent responding (n-14)			
Conversion type			Built up area in 1000 square feet			
From	To	Specification	1-3	3-5	5-7	11-13
Residence	Showrooms (n=7)	Tile	15	15		
		Kitchen and bathroom			14	
		Textile		14		
		Furniture				14
		Wedding card		14		
		Jewellery		14		
	Eateries (n=6)	Restaurants	17	66		
		Cafés		17		
	Offices (n=1)	Private			100	

Forty seven per cent renewed the interior wall finishes while 37 per cent added finishes to undressed walls. A good 33 per cent of the sample retained the existing landscape while an equal proportion had introduced landscape on bare grounds. A minimum number (7%) repaired existing landscape and an equal number replaced existing components with better alternatives like greener lawn, ornate fountains and better garden plants and accessories that were high in aesthetics and low on maintenance.

Cosmetic changes thus became imperative in refurbishment; only 80 per cent of the sample bothered to either enhance aesthetics or to adopt one major green tech option (to raise a garden). These reflect the attitudinal changes among the samples.

2.5. Refurbishment for Extension and Conversion: This part of the findings is presented under Table 2.

While 53 per cent of the sample did not require any extension, the others said that they required extension. Of the 47 per cent that required extension, buildings with a built up area between 3000 and 5000 square feet and those used for converting to showrooms and eateries required maximum extension. Restaurants requiring extensions made up the maximum. It was however surprising to know that even palatial residences with a built up area between 11,000 and 13,000 square feet also required extension.

Conclusion

The samples have tried to attune their efforts based on the 9R's by *restoring* the buildings and *renewing* its components, thereby *reducing* waste. They have also tried to *recover* and *recycle* whatever possible to *replenish* stocks to be *reused*. All these R's could only be pulled into the effort because the samples attempted to *rethink* about their duty to *replace* the present environment with a cleaner and healthier one. These stand as strong evidences for proving that adaptive reuse through refurbishment can render well to the practice of 9 R's in 'building use', at

the same time contribute generously to reduce pollution, debris dumping, and use of operating and embodied energy.

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