SIGNIFICANCE OF AFFORDABILITY IN UNIVERSAL DESIGN

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Abstract

Affordability is an important consideration while trying to create democratic interventions. However, it does not feature as one of the seven principles of Universal Design. Traditionally, affordability has primarily been concerned with economic aspects. However, mere economic considerations are not sufficient to create holistic mass interventions. Hence, this paper explores a broader meaning of affordability and identifies three critical levels of consideration. The first level of consideration is 'Value Affordability'; what values do we want to make affordable? The second level of consideration is 'Sustained Affordability'; how do we make these values affordable across time and scale? The third level of consideration is 'Access Affordability'; how can we increase affordability to make these values accessible to more people? In conclusion, the authors highlight the importance of affordability for creating preferable futures and suggest making it the eighth principle of Universal Design.

Key Words: *Affordability, Universal Design Principles, Universal Design India Principles, Values, Sustainability, Democratic Design, Social Sustainability.*

1. Introduction

Over the last few decades, design has emerged as a powerful tool for reducing social disparity. One of the most prominent disparities observed in the world today is that of economic variation. Though many designers have attempted to reduce inequality by making interventions more affordable, it does not feature as one of the seven principles of 'Universal Design'. 'Universal Design' was first defined in 1997 by a multidisciplinary group of architects, product designers, engineers, and environmental design researchers, from The Center for Universal Design, North Carolina State University. The group defined 'Universal Design' as 'The design of products and environments to be usable by all people, to the greatest extent possible, without the need for

adaptation or specialized design.' To achieve this, the group also identified seven principles; 'Equitable use', 'Flexibility in use', 'Simple and intuitive use', 'Perceptible information', 'Tolerance for error', 'Low physical effort', and 'Size and space for approach and use'. (The Center for Universal Design, 1997). Here we see that the essential idea behind 'Universal Design' seems to be to promote social equality. Hence, since economic disparity is a well-known cause for social inequality, it is surprising that affordability is missing. Of course, it may be argued that 'Universal Design' promotes cost reduction by promoting singular design solutions for diverse users. Also, equal opportunity environments encourage disabled people to become more economically independent. However, these seem more of a by-product of 'Universal Design' rather than a deliberate attempt to make interventions more affordable.

2. Inclusion of Affordability In 'Universal Design India Principles'

In 2011, a diverse team of Indian experts from disciplines such as design, disability, and policy making, decided to analyze the contextual aptness of the 'Universal Design Principles' for India. Collectively, they identified five 'Universal Design India Principles'. These were, 'Saman/equitable', 'Sahaj/usable', 'Sanskritik/cultural', 'Sasta/economy' and 'Sundar/aesthetics'. Specifically, the principle of 'Sasta/economy', stressed that the design should respect 'affordability and cost considerations for diverse users. Also, to achieve economically viable interventions, it suggested four guidelines. First, 'ensure affordability, durability, and maintainability'. Second, 'use local materials for energy savings and cost-effectiveness'. Third, 'focus on low unit cost through wide distribution'. Fourth, 'adopt modular approach to offer choice in features and price range' (Khare and Mullick, 2012). This deliberate inclusion of economic considerations or making interventions more 'sasta' (cheaper) raises an important question; Is affordability relevant for only the Indian context? This hardly seems the case as post-industrialization, affordability became a key design priority in many parts of the world.

3. The Role of Affordability in Design

By the end of the nineteenth century, Industrialization and mass production triggered a cultural shift in mindsets. Designed products were no longer limited to only the affluent classes. In 1876, Ducuing highlighted this aspect by stating that, 'taste and luxury are now the patrimony of the classes that are the least well to do' (Ducuing, 1876). Later, the use of modern methods of mass production such as the automated assembly line, further increased the rate of production while reducing the cost per unit. However, more supply was beneficial only if there was a matching demand. To help increase demand, manufacturers attempted to make interventions even more affordable. Hence, affordability became an important aspect for designers. Another factor that

helped propagate affordability was the social and political turmoil that occurred during the first half of the 20th century. Devastation due to The Great Depression and the two world wars, resulted in the need to create clear roadmaps for development. In 1937, economist Simon Kuznets proposed to capture all economic production by individuals, companies, and the government in a single measure. According to him, this measure would rise in good times and fall in bad ones. Later this measure was developed as the Gross Domestic Product (GDP). Finally, in 1944, GDP became the standard tool for sizing up a country's economy. (Dickinson, 2011). Hence, the notion of development and improved living conditions became directly equated with the production of interventions. In the 1960s, the Council of Industrial Design introduced a series of criteria to ensure that products accepted for its exhibition satisfied consumer needs. Featured amongst them was 'cost' (Benton & Baker, 1975). In addition to this, in 1974, 'economy' was announced as one of the criteria based on which Britain's Design Council gave awards (Hiesinger et al., 1993). Hence, affordability became a key aspect of consumer culture and national progress. It also helped pave the way towards democratic design and hence, became an important design driver.

4. Modern Methods Adopted to Achieve Affordability

Over the years a number of methods have been adopted by the industry to make designed interventions more affordable. Some of the prominent examples are listed in (Fig 1).
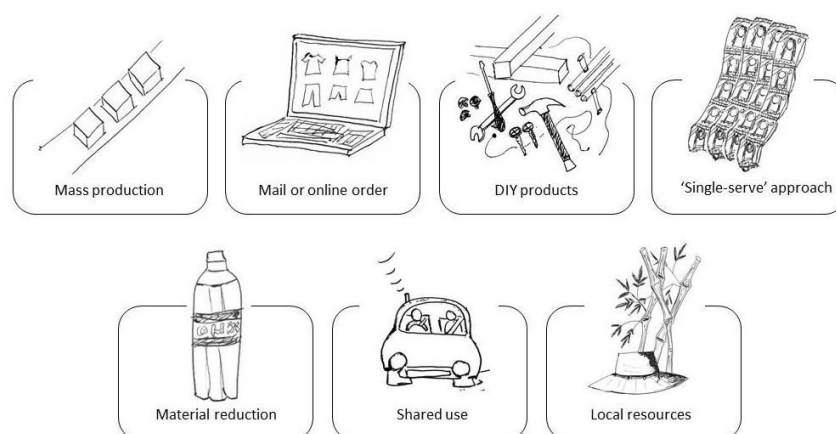

Fig. 1. Predominant methods adopted by the industry to make designed interventions more affordable.

4.1 Mass Production Through Automation and Standardization

Some of the greatest contributions to mass production were made by the automotive industry. In 1913 the Ford company began operating the first moving assembly line to manufacture its Ford Model T cars. This considerably reduced production time. The three other methods adopted by Ford to reduce costs were based on standardization. The first was by giving considerable

thought to logical arrangements. Ford's factories were designed so that workers could complete their tasks using minimum effort. To accomplish this, Ford standardized workers' methods. As a result, each worker performed only a set of repetitive actions. This made the process quicker and more efficient. The second was by consciously standardizing material specifications. Even though Ford could have made the cars in different colour variations as it did before 1914, it decided to opt for only black. This was because Japan Black enamel was the only paint that dried fast enough to match the new production time. However, after 1926 it again began to offer colour variations when the fast-drying Duco Lacquer became available (Georgano, 1985). The third was by the standardization of parts. Ford developed standards for its manufacturing components that enabled the large production of identical parts. This helped break down complex products into smaller and simpler components or modules that could be independently designed and manufactured. The final product was formed by assembling individual components. As a result, certain parts of the car could be added or removed without altering the rest of the car. Hence, designers could create a basic model for consumers and then add 'snap in' upgrades for those who could afford to pay more. Not only was this method beneficial for customers who could buy models based on their economic capacity, but it was also more sustainable for manufacturers who developed new product ranges using old parts. This allowed companies to incrementally upgrade their product ranges over time rather than frequently replace production lines. As a result, product development and testing costs were reduced. Additionally, it gave the manufacturers the flexibility to outsource various components to other manufacturing companies if needed. Hence, multiple companies may share similar standardized parts for their individual unique designs. Today, automation and standardization have become common practices that are adopted by most industries.

4.2 Mail or Online Order

A key way to reduce operating costs while increasing demand was the adoption of the mail-order catalogs that became dominant towards the end of the 19th century. The catalog system drastically changed the consumer retail landscape. Before this system, isolated communities purchased directly from local stores which had limited variety and sold goods at inflated costs. However, with the growth of industry and the increase in purchasing power, the demand for goods also increased. One of the most famous examples of mail-order catalogs is that of Sears. Though it began with a few items, it gradually expanded to include thousands of products attractively and systematically displayed within folded pages (Emmet et al., 1950). This helped customers quickly flip through many products which they might have missed at the store. Also, a major advantage of the mail-order system was that it did not have to waste money on

maintaining and running store space. As a result, its products were much cheaper than store products. Another benefit was that consumers did not have to come to a physical shop. Instead, the catalog and product reached them. This increased customer base and hence, demand. Today online platforms like Amazon provide similar advantages.

4.3 Do It Yourself (DIY) Products

The idea of ready to assemble products first emerged among furniture makers who made products that were easy to disassemble for transport (Europeana Foundation, 2019). However, manufacturers soon realized that this could also drastically cut production costs due to advantages in storage and delivery. Also, to further reduce production time and effort, the assembly function was transferred to the consumer. Over time, ready to assemble furniture became a popular option for consumers who wanted to buy designer products at economical prices. Today the biggest manufacturer of ready-to-assemble furniture is Ikea whose mission statement is 'to offer a wide range of well-designed, functional home furnishing products at prices so low that as many people as possible will be able to afford them' (Ikea website, 2021).

4.4 The 'Single-serve' Approach

The 'single serve' approach or Sachet marketing is the practice of serving products and services in small affordable quantities. It has been used for several decades now and is a popular method adopted by many companies (Singh et al., 2009). In this approach, companies such as those selling detergents or shampoos make 'single serving' versions of their products. It is especially used to address the needs of economically underprivileged societies or emerging markets where consumers may prefer to pay less more frequently. One of the best examples of a successful product that uses this approach is the single-serve shampoo sachet found in India. By 2004, 'more than 60 percent of the value of the shampoo market and 95 percent of all shampoo units sold in India were single serve' (Hammond and Prahalad, 2004). This approach has made branded products affordable to even the most remote parts of the country. As a result, today most people in India have access to both quality and variety when it comes to shampoos. Hence, creating a sense of inclusion and equality through affordability.

4.5 Material Reduction

One of the easiest ways to reduce product cost is to make it lightweight. Not only does this lower material costs but it also reduces transportation costs. However, lighter products lose strength and can easily crush under pressure. Hence, manufacturers began to apply structural supports in

the form of ribs to add more rigidity to the products without increasing material. This is especially seen in water bottles. The less the overall cost the more structural elements one can see on the bottles.

4.6 Shared Use

Another effective method of increasing affordability is to allow consumers to rent interventions for different time durations without having to own them. Shared use of interventions may take various forms such as in automobiles, a consumer may rent a car for a few months or hail a cab either directly or through a platform like Uber or Ola for individual trips. Also, a group of friends may decide to do a car pool so as to save money on daily commute. In the case of weddings or special events, people may rent their dresses and jewelry. In all cases, consumers are able to solve their purposes without having to pay for maintenance and storage.

4.7 Local Resources

The final method explored in this paper to reduce intervention costs is that of using locally sourced resources such as material and labor. This not only reduces travel costs but also costs related to training, research, and development as locally available knowledge and skills are more accessible. Also, this method helps promote local economic development and encourages the upliftment of smaller communities.

5. Moving Beyond Economic Affordability

Though it is evident that affordability has played a major role in promoting democratic design, it is also interesting to note how the design field has primarily concentrated on economic affordability. However, is this limited understanding of affordability sufficient? Whenever an innovation has entered the market, its natural progression has been to adhere to the elite and gradually become more economically affordable for the masses. It can be seen in the car, the phone, the computer, and nearly all other designed interventions. In 1913, Ford dreamt of making the car more affordable for the masses in America. Nearly a century later, in 2008, industrialist Ratan Tata introduced the Tata Nano which intended to make cars more affordable for the masses in India. Yet, is affordability only related to money?

6. Redefining Affordability

The term affordability is so intrinsic to human action that we often use it in our daily lives. Hence, to explore a broader understanding of its meaning we attempt to identify its common usages. To

do this, 250 randomly selected affordability quotes and cartoons were collected from the internet, existing dictionary definitions were considered, and two brainstorming sessions were conducted. As a result, it was found that some of the most prominent aspects that people valued concerning affordability were money, beauty, life (health or safety), social image (reputation), emotions and feelings (mental well-being), energy (effort), time, thoughts (intelligence), space, and habitat (Fig 2).
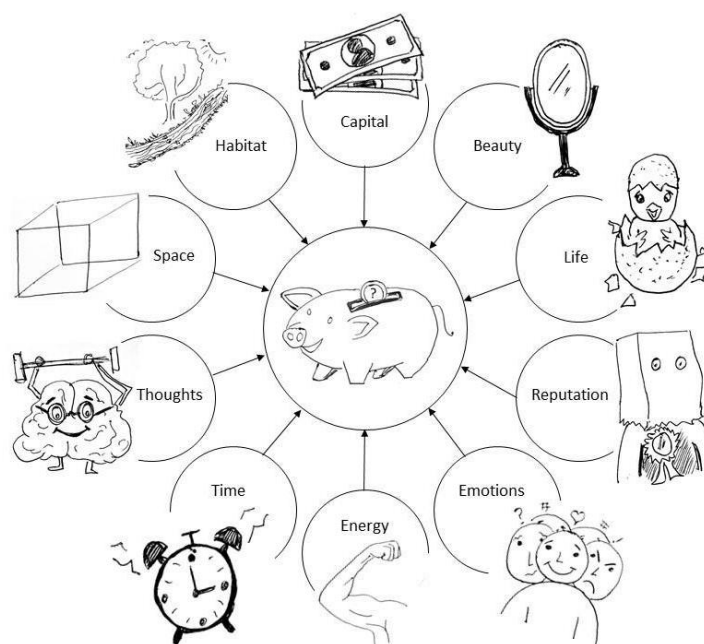

Fig. 2. The different currencies of affordability

These may be considered as the currencies of affordability. Using these currencies humans decide whether they can afford something or not. For example, people often mention 'I cannot afford to lose time, energy, capital, reputation etc. So, when designers ask 'how can I make an intervention more affordable?' What they are really asking is how can they make it affordable in all these different dimensions.

7. The Three Levels of Consideration

In a narrow sense, affordability may be considered as access to an intervention. For example, consumers who have sufficient money can buy 'x'. Hence, it may be said that those consumers have access to 'x'. However, in a broader sense, it is also related to the prioritization of values and the conception of future risks and limitations. Also, it is interesting to note that the limitation of some resources and the risks involved might become prominent only if an intervention is mass-produced or constantly used over time. For example, if the resource of pure air becomes limited over time due to pollution from vehicles, then it may lead to health hazards. Here we see that
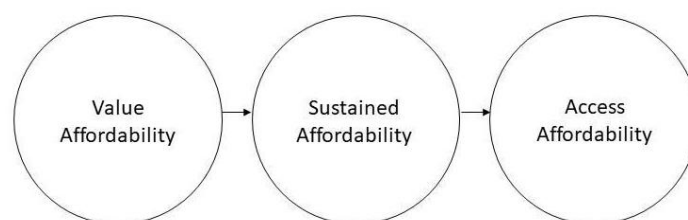
affordability can be explored at three levels.

Fig 3: Levels of consideration for exploring affordability

7.1 Value Affordability

The first level of consideration is Value Affordability; what values do we want to make affordable? As designers, before we create interventions, we need to first identify the values that we want people to have access to. For example, is it the car that we are trying to make affordable? Or, are we trying to make the values that we feel the car can provide such as comfort, convenience and safety, more affordable? In which case, the solution may not be a cheaper car. Instead, it may be a new intervention that is able to provide the same values as the car.

7.2 Sustained Affordability

The second level of consideration is Sustained Affordability; how do we make these values affordable across time and scale? For this there is a need to understand interventions as parts of larger systems. First, every intervention has its own life cycle which is important to understand. Second, when interventions are mass produced, they also have a cumulative impact which may hamper the initial values that it set out to achieve, for example; the car was initially intended to save consumers time during their daily commute. However, today, many consumers spend hours in traffic jams. As a result, in places like Mumbai, many people prefer to take public transport simply to save time. If a design is not able to meet its direct purpose in the long run, it cannot be considered a good design. There is also a need to understand the delicate relation between immediate individual affordability and long-term social affordability. For example, individually we might be able to afford the cost of a car, but the cumulative impact of cars on the society may mean that the society cannot afford it spatially, environmentally, or socially. However, community affordability always impacts the individual's affordability. If there is no space to park the car, the consumer will not be able to afford a car based on space currency. Hence, while designing we must constantly ask, is our dream affordable or sustainable in the long run for both the individual and the society?

7.3 Access Affordability

The third level of consideration is Access Affordability; how can we increase affordability to make these values accessible to more people? Traditionally, this has been achieved through economic affordability. However, it also involves other affordability currencies such as time and energy. What can companies do to make their interventions more affordable keeping in mind other currencies? Some of the solutions have already been explored in this paper such as the online shopping approach that enables consumers to save time and energy in traveling and searching for products. As mentioned before, designers often make the mistake of working first on access without considering values and sustainability aspects. There is no point in making an intervention accessible, if it or its context are not designed to be used by many people.

8. Conclusion

Using the three-level approach to explore affordability will greatly improve the ability of designers to create holistic interventions for the future. Though one might say that the existing principles of 'Universal Design' and 'Universal Design India' do include aspects of 'Value Affordability', they do not consider 'Sustained Affordability'. At the same time, 'Access Affordability' is completely missing from 'Universal Design' and partially represented in 'Universal Design India'. Hence, there is a need to acknowledge affordability in its broadest sense as an important design principle for all countries. Therefore, we conclude this paper by proposing 'affordability' as the eighth principle of 'Universal Design'.

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