Model predicts process of obsolescence, impacts on manufacturing
26 July 2021, by David Bradley

Research published in the International Journal of Product Lifecycle Management has looked at the concept of obsolescence. A. Sánchez-Carralero and C. Armenta-Déu of the Universidad Complutense de Madrid in Spain explain how they have developed a model to simulate the obsolescence process that leads to the need to replace durable goods.

The team shows how the benefits of replacement eventually outweigh the various costs of maintaining the original item nudging the user towards replacing the aging item. The model takes into account servicing as well as an irreparable failure that is the end-point of obsolescence in one sense.

"Prediction of obsolescence is difficult since many factors intervene in the process," the researchers explain, "some depend not on technology or market aspects but on user perception." They add that it is possible to model the obsolescence process and predict when an item may become unusable and so need replacing using sophisticated statistical models such as Bayesian analysis. Such analyses might even be used to optimize the manufacturing process itself. Of course, in a modern, capitalist society, consumerism is key to growth and so obsolescence is necessary if a company is hoping to have repeat sales from users once they and their competitors have saturated the market.

As such, the much-derided, and the perhaps unethical notion of "planned obsolescence" is prevalent. In this, the manufacturers design their durable goods to essentially have a lifespan limited by factors they might control rather than the lifespan being governed by the way in which a user uses the item. There is an amusing and universal tale of the broom one’s grandparent used the same broom throughout their lives bought with their first home, used daily and only having had six replacement heads and seven replacement shanks.

Obsolescence is essentially entropy, the tendency of a system to move towards disorder and chaos. Understanding the obsolescence process of more sophisticated systems than a broom can help in the marketing of new products as well as perhaps allowing manufacturers and sellers to predict their future profits based on a model of obsolescence for their products and the reliability and replaceability of those products. Brooms wear out and have to be replaced, even Grandma will admit that.


Provided by Inderscience