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What do engineered wood products and Ford Model T have in common?

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The first automobiles, representing a great product innovation, were manufactured decades before the debut of Ford Model T in 1908. Yet it was Model T, which changed the global transportation market and logistics infrastructure by introducing reasonably priced cars that could be purchased by ordinary people. The solution was the industrial mass production. Ford Model T's production process is a classic example of a disruptive innovation, *i.e.*, an innovation that creates a completely new market or displaces existing products or services from the markets, thus causing greater societal impacts than plain product innovations. Disruptive innovations do typically arise from small firms or start-ups, while the market leading companies generally focus on sustaining innovations, *i.e.*, incremental improvements of their existing offerings.

Solid wood has been used in building construction for thousands of years. Its load bearing capacity and dimensions are, however, limited by the physical dimensions of the tree trunks. A logical manifestation of this fact is that wood evolved to a main structural material of small-sized buildings. Most structural elements of large urban buildings, on the other hand, were made of industrially produced homogeneous materials with unlimited dimensions and great compression (concrete, steel) and tensile (steel) properties since the late 1800s. Wood – wherever sufficiently available – turned into a material of small rural houses and infrastructure, while other materials took over the huge urban market of large buildings during the last 150 years. This paradigm is now gradually changing because of engineered wood products (EWPs).

The EWPs, such as cross-laminated timber (CLT), glulam, and laminated veneer lumber (LVL) are industrially manufactured by gluing smaller pieces of wood together to produce almost dimension-free billets with stable and controllable properties. Their load-bearing capacity in relation to mass is excellent. The density (ca. 500 kg m^{-3}) of wood is distinctly lower than that of concrete (>2400 kg m^{-3}) or steel (>7000 kg m^{-3}). Therefore, the EWPs are energy efficient and easy to transport and assemble – all particularly important factors in urban construction. Material homogeneity allows structural designers to use smaller safety margins with the EWPs than with solid wood products. Their dimensions can be man-made over those of traditional solid wood members, which enables managing higher design loads, broaden architectural opportunities, and enable building larger and higher structures with wood. Wood's compression and tensile strengths being more than tenfold in parallel-to-the-grain direction compared to the transverse directions, the EWPs with longitudinal grain orientation stand for the highest attainable capacity under compressive or tensile stresses. This is quite relevant in the vertical structures of high-rise buildings.

EWPs may be seen as disruptive innovations: they bring wood back in urban construction via large buildings, thus streamlining a systemic change in the entire construction sector. Global construction and renovation volumes are expected to grow especially in urban areas, and environmental reasons generally support wide use of low-emission renewable materials. The contexts of economic, environmental, and technical performance of individual wood products have attracted a great deal of scientific attention. From that view, it is rather surprising that there are no studies devoted to their societal impact mechanisms.

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