

Distributed Decentralized Rural Agile Manufacturing

Joel Neidig
ITAMCO
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The future of manufacturing is not an urban centralized industrial complex, but rather one where manufacturing takes place at the point of use for the consumer. With the advent and democratization of 3D printing in combination with a distributed decentralized digital thread using Blockchain; the sharing of ideas, designs, and products can be consumed at the point of use while still maintaining intellectual property and providing the best price model for the seller and consumer.

Imagine, a farmer in Indiana has a tractor that recently broke a pulley on the engine. Instead of the local supply store having to stock hundreds of thousands of dollars of inventory or ordering the part from the manufacturer and waiting for delivery; they have one metal 3D printer that they can print any part on-demand from the OEMs catalog and provide it within the same day to the farmer. Thus, reducing the overhead of the local farm supply store and providing the most competitive priced component to the farmer.

Now, how do we protect the intellectual property and everyone between? Enter the Blockchain. The blockchain is a chain of blocks that form a database. Devices that store these distributed data are not shared servers. Each block is an ordered record that contains a reference to the previous block and the time stamp. The list of blocks inside the database is constantly growing. The principle of the blockchain is to combine digital records into blocks. Complex mathematical algorithms link these blocks together in chronological cryptographic chain then new units are at the end of this chain. To rearrange the blocks in some places impossible, the system will reject such action on the basis of the timestamp and structure. The digital thread of models to 3D print various products for OEM catalogs can be secured in these digital blocks and only be accessed if payment is made and then the file can be used once for printing on the machine payment is made through. It's almost like a "manufacturing vending machine."

A great physical example of this is Coca-Cola. They set up a business model in which everybody makes money. Within very short order, they had worked out a model in which the bottlers, transporters, servers, soda fountains — everyone was making money. There was also a big push during World War II. Coca-Cola made a deal with the Army to provide a Coke to any soldier anywhere in the world at a nickel a piece, and they got the Army to support that. This means the Army did all the transportation and helped build bottling plants. At the end of the war, infrastructure was in place in practically any country in the world and there was a whole generation totally devoted to Coke.

Brining manufacturing to the source of use is the future, large warehouses and storage facilities like Amazon distribution centers will be a thing of the past in 20 years. Everything from

consumer products to electronics to industrial components will be printed on-demand via Distributed Decentralized Rural Agile Manufacturing.