

THE IN-TIME(S)

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Extracts based on the book "Inventing for the Sustainable Planet" - the inner and outer journey to sustainability.
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Article from the Future: Module based design and manufacturing drives re-localisation

By Stephen Hinton

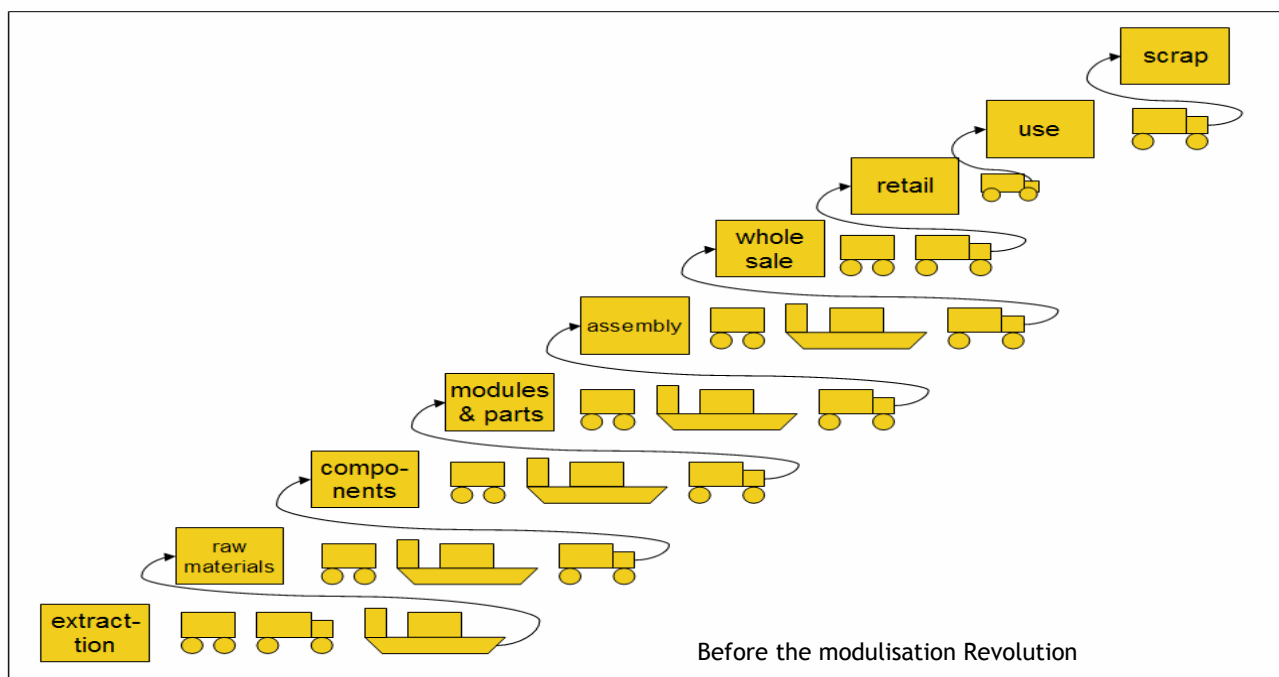
One major change brought about by the rise in energy prices was the shift to module based product design and manufacturing. On the face of it, the change was minor, but it required a major shift in attitude. Our reporter talks to Jeff Handy, from the PORENA manufacturing and distribution unit.

Many people still don't see the difference between module based manufacturing before and after the energy shortages - can you explain?

ABOUT THE IN-TIME(S)

We are living at the peak of human achievement, but also at the peak of our resources. Sustainable development means handing over to future generations the possibility to create for themselves a standard of living at least equivalent to that we enjoy. This requires fundamentally re-thinking how we use resources, indeed all of the social arrangements we take for granted. And we need to start now. Ideation, imagining, even fantasizing are tools we can all use in this re-thinking process. The technique used to provide the basis of these extracts, Imagestreaming, opens up endless possibilities to explore our ideal future.

In module based manufacturing final assembly is done by one local unit which is not owned by the brand, and the product goes straight from manufacturing to the customer. The other main difference is that the product always goes back to the factory. It is never scrapped. So products' life times are far longer.



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The other difference – and this is what gets some people – is that each product actually has more material in it. This is because there is more redundancy in each module used to make up the product.

Thanks. Can we start by reviewing the shortcomings of design and manufacturing for retail before the energy price hikes?

As fossil fuel production plateaued, the average number of steps to get a product to the customer was seven. Each step was energy consuming, and the transport between steps started to get impossibly expensive. And the average usage life time of a product was short, much shorter than its MTBF – mean time between failure. The amount of scrap was incredible, much too much to be taken care of effectively. The average amount of material converted to waste was 30 kg for every 1 kg of product. That meant – with a product life time of 3 years – a total of 31 kg of waste for 3 year's service. The question became: how do you provide people with good quality products, in wide variety, that can be updated as well, without many manufacturing and transport steps and waste creation?

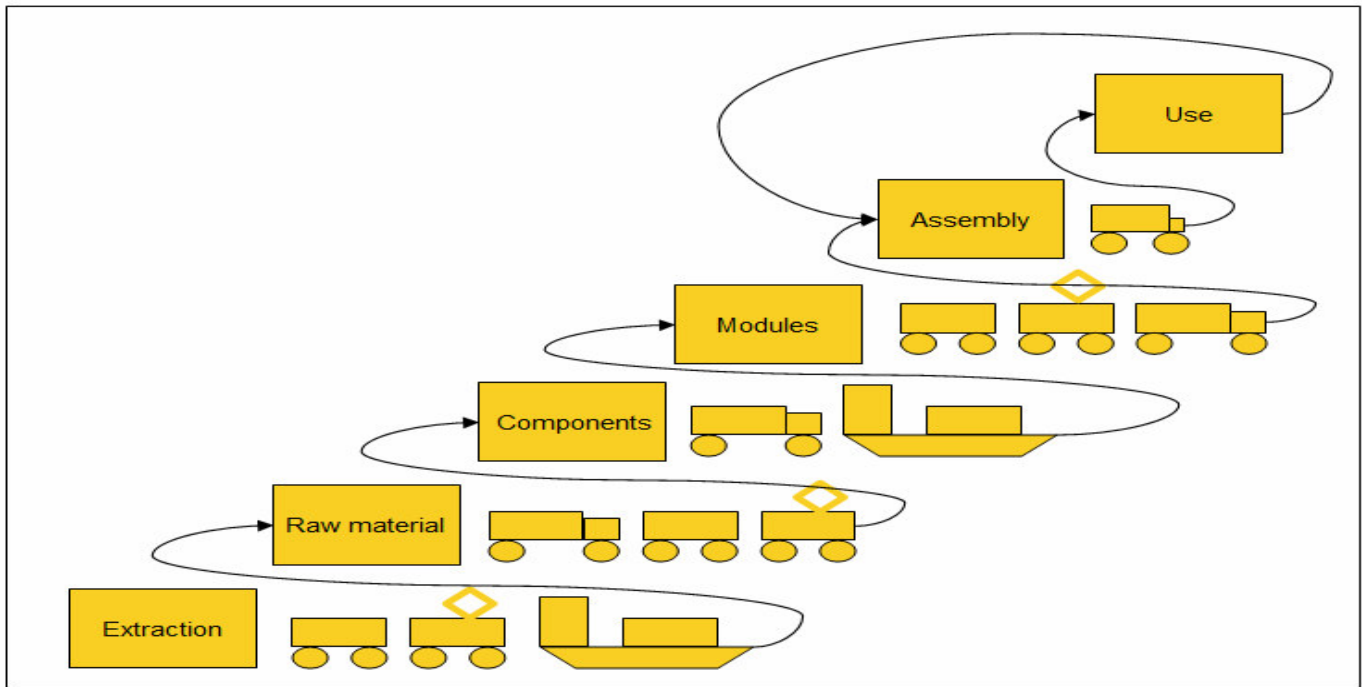
The first thing to do is eliminate the last step ... the retail trade. Getting your goods straight from manufacturing eliminates transport, warehousing, retail space, etc. It also makes sure you manufacture exactly what the customer wants ... no unwanted products sitting on the shelf.

The next step to eliminate was scrapping. Components – and we are talking everything from furniture to TVs – all have different life times and uses. For example: when people scrapped their VCRs for DVDs 80% of the components were similar. So this was solved by designing products for update. You just took the product back to the manufacturer to get it updated, upgraded, mended, whatever.

Either the component was re-used directly or recycled. These components can be seen as nutrients – technical nutrients. Either they can be broken down and fed into another process or broken down to their constituent elements. Either way they are **designed** to be re-used.

This ties together with the third step, dematerializing of brands. The brand as we knew it evolved into being a pure design company – and I don't mean just physical design, but technical as well. The dematerialized company provided manufacturing instructions to an assembly company, which was local. Consumers ordered their product, and the assembly shop put it together based on designs by the brand. The components were mostly standard with a small percentage of custom parts.

This paved the way for the fourth step: eliminating the shipping of finished goods. All that is shipped is modules to be put



After modularisation.

together locally. The assembly is carried out in the same organization that takes care of service and upgrading. So you would find at least one assembly and service shop at each town.

I understand this thinking led to new services and whole industries changing the way they do things.

Some amazing things happened. Component manufacturers and module manufacturers made sure there were CAD/CAM representations of their products. This meant that brand name designers could sit and electronically design their products, loading in the components to their design applications.

Another thing that it gave rise to was the technical nutrient bourse. An on-line exchange of components for recycling or reuse.

So how much more effective is module based manufacturing?

We estimate there is a 30% reduction in energy intensity in the whole system, without counting the average lifetime of the product is extended from 2 to 12 or even 20.

Perhaps you could go over the main features and benefits of the system again for listeners?

Sure, let's see...

One local assembly shop; gives economies of scale for assembly and recycling, and closeness to the customer.

Brand as design. Allows companies to concentrate on their particular Brand values and look and feel – using global competence to reach a pinnacle of excellence whilst giving them global reach.

Standard modules; These modules actually allow for more variation and product variants, which are often endless.

Return to local shop. The benefit is no scrap, 100% recycling, a long lifetime which is energy effective, and no mass transport of goods.

Long product lifetime. This reduces the overall ecological footprint of the use of the product over its full lifetime.

*This is an extract from the coming sequel to the book "Inventing for the Sustainable Planet"
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This article was envisioned using the techniques of Imagestreaming. Find out more at www.winweger.com