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Intel has to Totally Rethink Supply Chain to Get to Cost Target for New Low Priced Chip

Supply Chain Cost Reduction of 80%? "Radical Change" is Needed

SCDigest Editorial Staff

What do you do when you have to reduce total supply chain costs by as much as 80%.

Start with a blank sheet of paper, and rethink every assumption you have.

That was part of the message from **Jim Kellso**, a senior "Supply Chain Master" at Intel, who was chosen to lead to process of dramatically changing the supply chain approach for Intel's new Atom chip.

The basic problem: traditional Intel chips may sell for about $100, and have supply chain costs (including inventory costs) of about $5.50, or 5.5% of revenue – an acceptable cost ratio.

Recently, however, the company planned the release of its new Atom chip, a product that was not targeted at traditional uses such as PCs, but consumer electronics, mobile devices, web only computing, emerging markets, and other applications that in total represent an annual revenue opportunity of $10 billion or more.

The challenge: the Atom would sell for only about $20 initially, and was headed for an average selling price of perhaps just $10 in a few years. Obviously, a $5.50 cost for the supply chain wasn't anywhere near good enough at those sell prices. Supply chain costs needed to be brought down to perhaps under $1.00 – a decrease of as much as 80% of the level for traditional chips.

At the annual CSCMP conference in Chicago, Kellso said he was tasked to come up with an answer. As most would do, Kellso said he assembled a team of cross functional managers, went into a room, and began looking at opportunities to reduce costs.

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But, Kellso said, it became clear that Intel would not be able to "increment ourselves to success." Instead, something "radically different" would be needed.

Forming the Team

Kellso took on the role to head this supply chain transformation with some provisos. First, he requested that he be able to pluck 10 of Intel's best people for the project – but importantly, only half time. Half time would also be spent on their existing responsibilities – reducing management resistance versus requesting a full time commitment for the project. Kellso also asked for funding for three outside consultants for the team.

Ultimately, as news of the project and positive feedback emerge, others not on the core team volunteered their time – some 35 staffers at Intel contributed time to the effort over six months.

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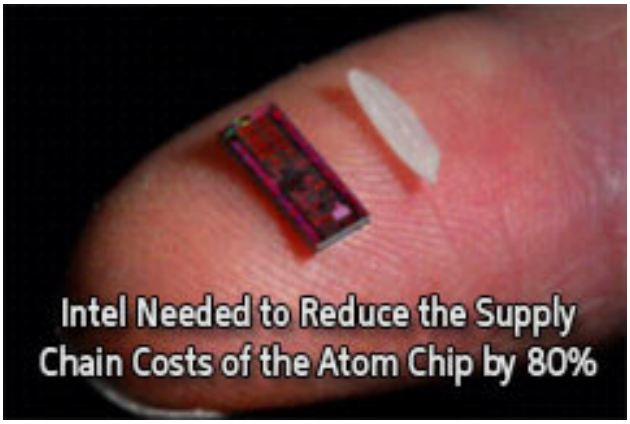
What was immediately recognized as a game changer was that the usual cost-service tradeoff wouldn't work for the Atom. Service had to stay the same or improve while ratcheting costs dramatically down.

To do that, the team recognized it had to have very few constraints in its thinking – the only "must do" the team really operated on was that Intel's own factories, or "fabs," had to be used to produce the chip.



Focus on Inventory

Computer chips are small, and have an extremely high value to weight ratio. Therefore, there were only marginal opportunities to improve distribution costs, and even less in transportation.

At the same time, inventory carrying costs represented the preponderance of total supply chain costs.

For its traditional chips, Intel operated on about a nine-week total order cycle time with its customers. During the first seven weeks of that time, there were generally many order changes from the customer – over 90% of the orders were changed after the initial order was placed, Kellso said.

This also led to inventory builds, as the factories spent a long time optimizing and re-optimizing the factory schedule, in part dealing with all the customer change orders.

However, those order changes dropped to single digits in the last two weeks – as Intel's customers froze their own MRP runs.

Kellso and the team wondered if the process could be moved to a more true "make-to-order" model – with firm orders accepted and then delivered in two weeks instead of nine.

"We had to determine, 'Could be plan within four days, and then have no changes allowed after that?'" Kellso said.

The team analyzed the possibility, and initially found that while this might lead to a small hit to factory utilization, those costs would be more than offset by the reduction in inventory, storage and handling for all the chips that currently went into the distribution center.

Kellso said that as good as Intel's supply chain is, it had some "institutional perceptions" that would have to be overcome. Those included that in this industry, "You can't truly build to order," and that "It wasn't possible to be fast and have high factory utilization at the same time."

But those were actually fallacies, the team believed – and key was the compression of cycle time in combination with an end to change orders and schedule adjustments.

To make this change, Intel proceeded in a series of "spirals" that incrementally moved the process towards its final goal. Obviously, major work had to be done with Atom customers to buy into the idea, and then to actually operate their own supply chains consistent with this new strategy (order and inventory planning, etc.).

An Intel factory in Asia was chosen as the pilot fab plant, and the plant manager their quickly embraced the approach. The experienced showed that not only could the inventory costs be brought way down, but

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that the minor hit expected to factory utilization did not materialize, providing more benefits than expected to the supply chain program.

The make-to-order model initially brought the supply chain cost per chip down to $1.40 or so. Kellso said they expect to get that to under $1.00 some time in 2010.

Meanwhile, the rest of Intel is looking at the success of the new approach to the Atom chip supply chain – and is likely to adopt many of the ideas into the supply chain processes of Intel's traditional chips.