

# Obsolescence Management: For Product Lifecycle Profitability

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A SiliconExpert White Paper



# Proactive obsolescence management is key to maximum product lifecycle profitability

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The electronics industry is growing at a rate three times faster than the overall US economy, making it one of the most important global industry sectors. In fact, semiconductors, computers, and the consumer electronics industries are three of the top contributors to the US economy.

Because of the accelerated rate of technological advancement, new materials, components, and processes are being introduced at an ever-growing rate, which is adding a lot of complexity to product electronic component life cycle management.

Today's competitive marketplace coupled with the modern consumer's need for faster, easier and more efficient products are driving the need for more advanced components. It is estimated that the average life cycle of a new component is now less than four years. In 1998, it was 10 to 12 years.

## The rise of IoT and Edge computing puts more pressure on performance

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The growing number of the Internet of Things (IoT) devices is also responsible for the continuous change of product specifications and performance. Many of the original machine-to-machine (M2M) devices installed just a few years ago are not compatible with the new cellular networks or other wireless standards.

In fact, some cellular carriers started to turn off their 2nd and 3rd generation mobile networks (2G and 3G) to force customers to use 4G LTE for their devices<sup>1</sup>, thus saving on network spectrum licensing and maintenance costs.

Furthermore, most IoT devices today connect via non-cellular technologies, including wired Ethernet, and wireless standards such as LoRaWAN, Zigbee, and WiFi.<sup>2</sup>

These different protocols are in constant evolution, fueled by the demand for more bandwidth, a larger number of connections, and faster connectivity. While most of the new gateways support previous generations of devices and protocols, the availability of chipsets for the original devices poses bigger challenges.

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1 End Could Be Near For 3G In The United States <https://www.ecnmag.com/blog/2017/12/end-could-be-near-3g-united-states>

2 Ericsson Mobility Report June 2019 - <https://www.ericsson.com/49d1d9/assets/local/mobility-report/documents/2019/ericsson-mobility-report-june-2019.pdf>

# Government awareness and proactive regulation

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Government agencies recognize these challenges, and some are establishing guidelines for replacing computer equipment. The state of Michigan has mandatory replacement of computer equipment every five years (four years for laptops and mobile devices).<sup>3</sup>

## The pitfalls of a short lifecycle

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Replacing some products, however, is more complicated, and many require longer life cycles for continuous operation and maintenance. Smart meters, for example, operate for decades.<sup>4</sup> Consumer appliances, such as refrigerators and washing machines, are also expected to operate for many years without needing to upgrade electronic parts.

The shorter life cycle of components and electronic products is of particular concern to the aerospace and defense industries. Industry giant Boeing recognizes the problem, and has determined that “[...] 60% of the integrated circuits currently on aerospace products will be obsolete (out of production) within five years because production cycles of today’s components are far too short to support aerospace products whose useful lives exceed 30 years.”<sup>5</sup>

To address this challenge, Boeing, together with other industry stakeholders, is developing a set of international standards that will allow aerospace OEMs to use the same component management processes for all programs and customers. Additionally, Boeing has established a company-wide obsolescence management board to address issues related to component obsolescence.<sup>6</sup>

The lack of availability of materials and spare parts from the original manufacturers is equivalent to the end of product support. For these and other industries, every year gets more difficult to secure the supply of compatible components for their systems.

## Designers need to make quick changes and manage EOL components

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The designers of the original equipment must expect general trends. A well-known principle of semiconductor products is Moore’s Law, which states that a semiconductor device will double in complexity every 18 months.<sup>7</sup> New products should provide design and layout flexibility to accommodate these trends.

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3 Information Technology Equipment Life Cycle [https://www.michigan.gov/documents/dtmb/Sec\\_829\\_IT\\_Lifecycle\\_Report\\_2019\\_646889\\_7.pdf](https://www.michigan.gov/documents/dtmb/Sec_829_IT_Lifecycle_Report_2019_646889_7.pdf)

4 Rolling out smart meters - UK National Audit Office <https://www.nao.org.uk/wp-content/uploads/2018/11/Rolling-out-smart-meters.pdf>

5 Electronic Component Obsolescence [http://www.boeing.com/commercial/aeromagazine/aero\\_10/elect\\_textonly.html](http://www.boeing.com/commercial/aeromagazine/aero_10/elect_textonly.html)

6 Idem

7 Summary of Moore’s Law and Technological Determinism [https://technoslipstream.com/2018/10/summary\\_paul\\_ceruzzi\\_moores\\_law\\_and\\_technological\\_determinism](https://technoslipstream.com/2018/10/summary_paul_ceruzzi_moores_law_and_technological_determinism)

Also, design engineers need to prepare for system upgrades. As components become obsolete, it is necessary to redesign the product, and update the bill-of-materials (BOM) to maintain production and extend support time.

Managing and updating BOMs is especially critical for long life cycle products (smart meters, in-vehicle electronics, appliances, avionics, etc.) where choosing the right component and manufacturer can influence how long OEMs can support the product.

Additionally, replacing original components for new ones on an existing design could be achieved, if the package is pin compatible, but could add additional costs to the product.

Furthermore, different versions of the same product might have differences in performance and reliability which, in turn, can impact productivity. These changes should be properly documented and announced to end-users to avoid support issues.<sup>8</sup>

Electronic manufacturers also send regular Product Change Notifications<sup>9</sup> (PCNs). These documents inform changes in parts or a family of parts. Changes range from obsolescence to materials and label changes. While some changes might not affect production or performance of the final product, designers need to be aware to evaluate potential BOM changes.

## Challenges of procuring end-of-life components

One of the most important challenges in today's design of electronic products is accurately forecasting the end-of-life (EOL) of product components. Most of the time, engineers start a new design with some components in mind, and build a BOM of those components, many of which they have some samples in their labs.

By the time the engineering team starts testing prototypes, one or more of the components has been declared EOL by the manufacturer. EOL notices are posted industry-wide, and many OEMs are now sourcing commercial off-the-shelf (COTS) components.

Buying COTS components poses an additional challenge: When the original parts go EOL, OEMs are now competing with consumer, automotive, and other industries for leftover parts.<sup>10</sup> Another challenge is managing the leftover inventory after an engineering-change-order (ECO). Sometimes, when a component goes EOL, production with a new version of the component starts immediately so as to avoid delays, and some of the original EOL parts are still in inventory. Managing that inventory, besides the cost originally associated with it, causes more complications.

Furthermore, the electronic supply chain is constantly disrupted by company mergers and acquisitions (M&As)<sup>11</sup>, which represent one of three largest causes of obsolescence. In many of the M&As, the companies involved have similar products in the market, and they start eliminating redundancies to optimize their bottom line.

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8 Taking the Guesswork and Human Error Element Out of Supply Chain Management  
<https://www.youtube.com/watch?v=3ozGBLNeF9M>

9 <https://mlps.siliconexpert.com/rs/915-PAG-153/images/PCN%20Infographic.pdf>

10 Component Obsolescence: Managing the Unmanageable - <https://epsnews.com/2018/08/27/component-obsolescence/>

11 <https://mlps.siliconexpert.com/rs/915-PAG-153/images/M%2BA%20Infographic.pdf>

# SiliconExpert can help manage EOL components

Founded in 2000, SiliconExpert ensures that companies design and maintain sustainable products with transformative visibility to their supply chain. Customers globally use SiliconExpert's solutions to manage risk, avoid redesigns, and mitigate obsolescence in innovative industries such as, but not limited to, consumer electronics, telecommunications, automotive, medical, and aerospace.

SiliconExpert's BOM Manager™ optimizes the use of components using data from its extensive database of more than one billion parts, helping designers find the best combination while reducing cost. The tool reports risk data, product life cycle management, multi-sourcing, regulation compliance (RoHS/REACH), component selection risk, and inventory availability from authorized distributors.

SiliconExpert Estimated Years to EOL algorithm<sup>12</sup> can detect parts that have lived longer than expected, and SiliconExpert's SaaS solution flags components subject to obsolescence. That way customers are aware when end-of-life (EOL) notifications are likely to occur, always updated with the latest information available from manufacturers and distributors.

SiliconExpert is also investing in new artificial intelligence and machine learning solutions, developing algorithms that will use historical data to detect potential changes and issues before they occur.

To learn more about SiliconExpert, BOM Manager™ and how we can help you to manage obsolescence and EOL of components, please contact your SiliconExpert representative or visit:

[www.siliconexpert.com/insights/obsolescence](http://www.siliconexpert.com/insights/obsolescence)

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12 How Reliable is EOL Forecasting? <https://www.siliconexpert.com/sites/default/files/assets/pdf/ReliabilityReport.pdf>



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