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Dealing with the Obsolescence in state-of-the-art Electronic Components

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Contents

- **What we do.**
- **The obsolescence of state–of-the-art electronic components:**
  - Trends in high-tech industry
  - Impact of the software structure
  - Community knowledge
  - Business models
- **The topics above will be presented with our main product, Libera Brilliance Beam Position Processor, as an example.**

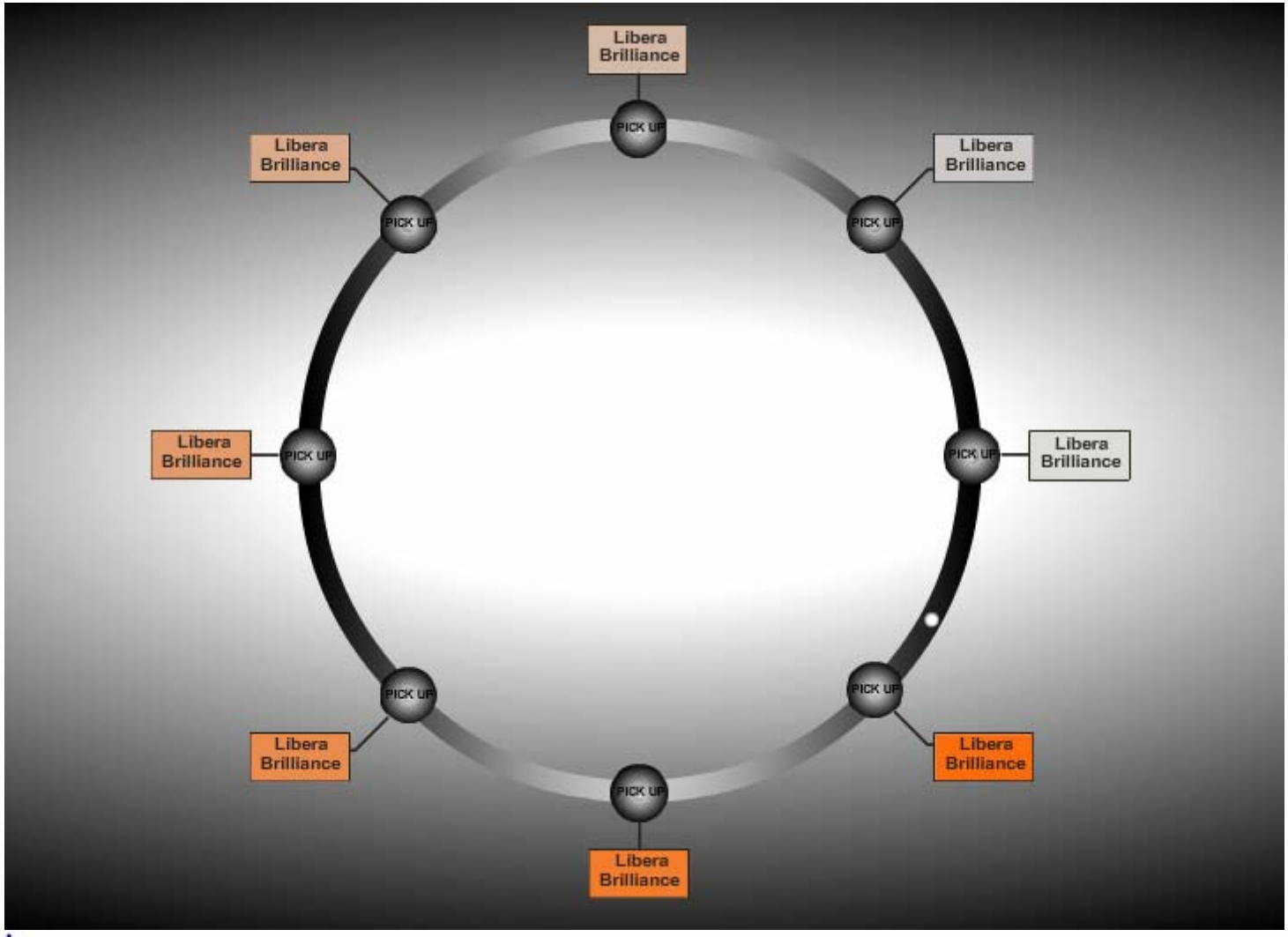
Our Company

- **Expert team.**
- **Design of innovative solutions.**
- **Tight collaboration with our customers.**
- **High quality products.**
- **Growing community.**

Our team with participants of 3rd Libera Workshop, two days ago.

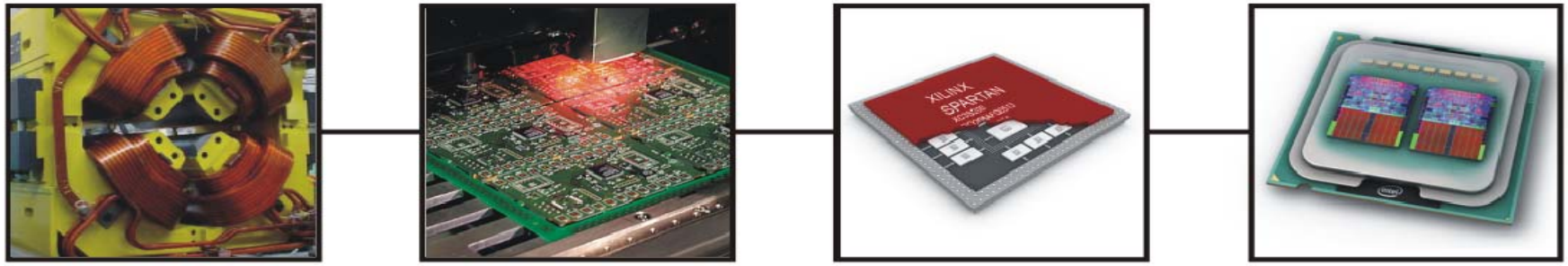
Libera Brilliance Beam Position Processor

What Libera Brilliance Does



Trends in High-Tech Industry

MAGNETS ANALOG FPGA PROCESSORS



Different categories of products become obsolete in very different typical time intervals. Things are even more interesting when a product is complex, composed of different categories.

Overview of Basic Rules to be Respected

- To buy the components from reliable and well known manufacturers.
- To follow the technology development on the world market of components.
- To follow the trends regarding different standards (e.g. PCI Express, ATCA, ...) and their potential.
- To build and maintain a standard interface towards the user.

Maintaining the Product Through its Lifecycle, 1

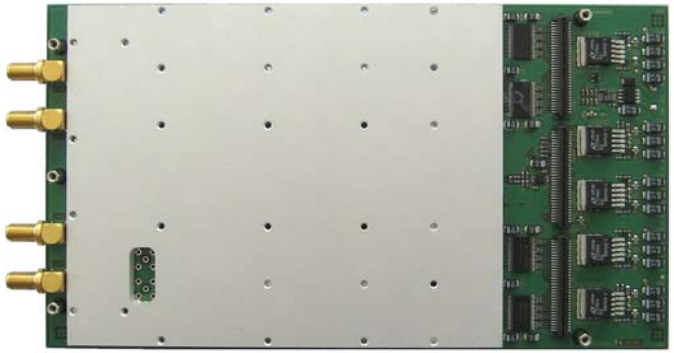
- **On the component level (e.g. FPGA), planning the stock having in mind:**
  - **Danger of obsolescence, foreseen dates**
  - **Probability of failures, affecting number of components needed to maintain products already sold.**
  - **Expected number of product to be sold by the end of its lifecycle.**
  - **Note: Some companies (e.g. Linear Technology) guarantee no obsolescence of their components.**

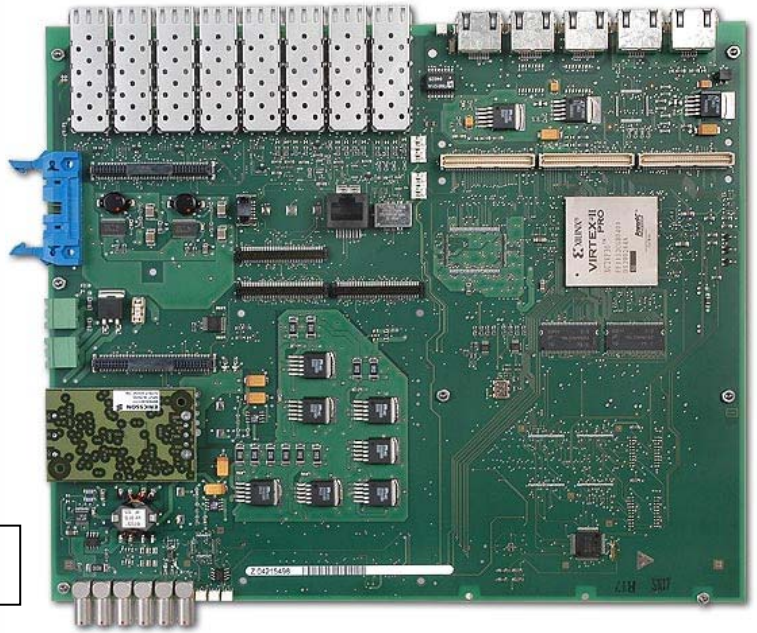
Maintaining the Product Through its Lifecycle, 2

- **On the subsystem level:**
  - **Use standard subsystems where possible (e.g. Single Board Computer) with standard interfaces as well.**
  - **This eases the replacement of the whole subsystem in case of obsolescence (or better performance of possible subsystem replacement).**
- **On the product (system) level:**
  - **Keep a structured software hierarchy, with well defined and standard software user interfaces at the top.**
  - **Such structures allow the exchange of the complete product hardware, with no consequences for the user (e.g. PC using Windows)**

Libera Brilliance - an Example of a Vertically Integrated Product

Analog Board



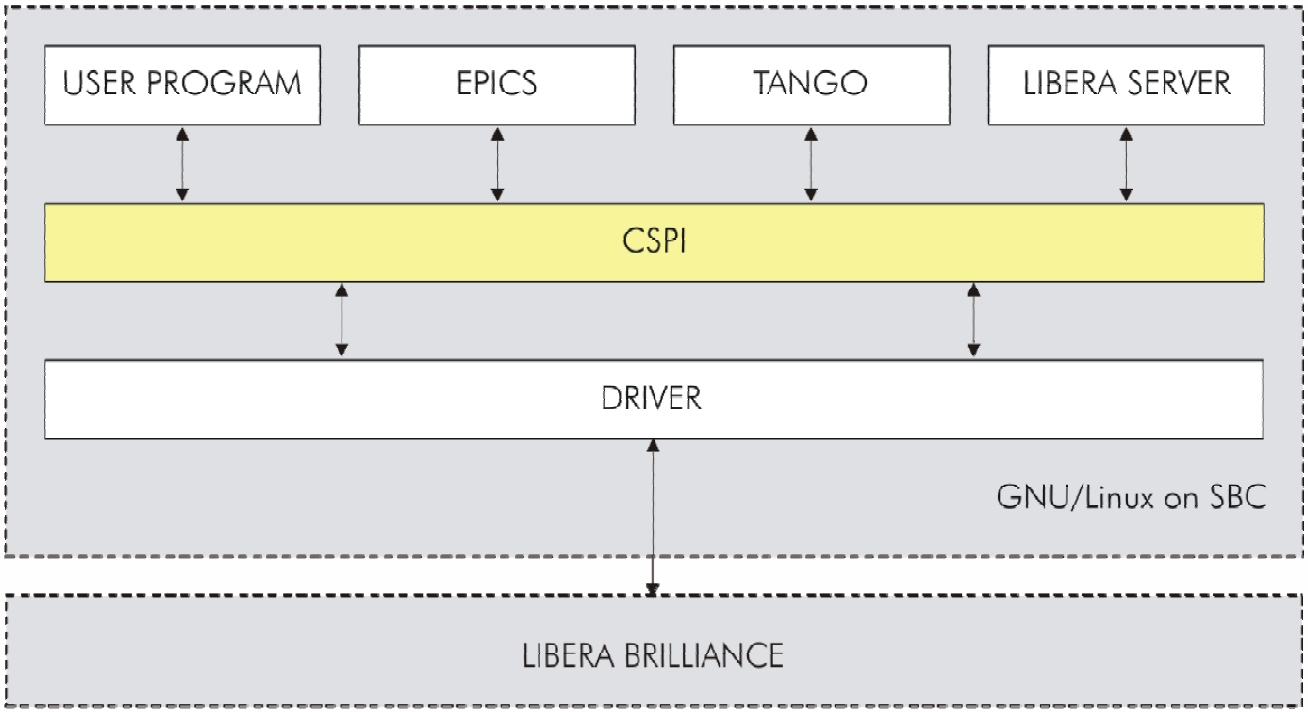


Digital Board

SBC

- **Libera is a typical case of a vertically integrated instrument. It does analog signal processing, digitalization, digital signal processing and it features Ethernet connection for direct connection to the control system at the top.**

Libera Brilliance Software Structure



- **CSPI (Control System Programming Interface) is a maintained library, which hides all the hw details from the user.**
- **Such a structure allows even hw changes without affecting user's application(s).**

Our Business Model – Wish List

- **Users subscribe to an "Upgrades and Support" program, paying an annual fee.**
- **Each customer contributes to a common Wish List, generated during independent users' meetings and then adopted by the company (after as many open discussions as possible).**
- **Open discussions with users during annual Workshops, organized by the company.**
- **Such open knowledge helps to decide which upgrades on which level are really necessary.**
- **SW Release cycle is 6 months.**

Libera Brilliance BPP example

- **Based on older Libera Electron BPP, successful and widely used product**
- **A new product with order of magnitude better metric performance**
- **New analog board, built from scratch, new 16bit ADCs.**

Thanks to consistent software structure, where all the changes are hidden below the CSPI library, the change from Libera Electron to Brilliance is extremely easy from the control system integration point of view.

Improvement of performance by in-factory upgrading from Libera Electron to Libera Brilliance is also possible and cost effective.

Warranty of our Products

- **2 years absolute warranty**
  - Reparation or replacement of the product for free
- **7 years repair warranty**
  - Component replacement
  - If not possible, product replacement
    - New product
    - Equal or better performance
    - Identical control interface

Summary

- Obsolescence of hardware components is a fact and must be properly addressed.
- But the obsolescence of the software is also a very important issue. The miss-match of the versions of some sw tools can be a real problem.
- Modern instrumentation is heavily dependent on software, the frontier between analog and digital signal processing is being pushed more and more towards the sensors.