7 Critical Considerations for the Interface Development Decision

As a camera or imaging system designer, you have the choice to develop your own video interface or to buy an already-developed solution like those offered by Pleora. Further, you'll need to decide if you will develop a proprietary offering or one that is based on an international vision standard. After more than a decade of experience, with a singular focus on video interfacing technology, we have a few tips to share to ensure you don't run into unexpected or "hidden" costs.

Whether selecting a USB3 Vision™ or GigE Vision® interface, you'll want to be sure that you've considered the following in your total cost of ownership calculations.

1 Standards Knowledge

Does your company have a strong knowledge of the relevant standards? This knowledge is an essential requirement in the development of video interfaces. The simple act of reading through volumes of standards documentation will certainly eat into precious development time, but that won't be sufficient enough to fully understand any standard. Real-world experience that includes testing implementations—for standards compliance as well as interoperability with third-party products—is an essential part of this process.

Consider the advantages that an expert vendor can bring to your organization in terms of:

- Real-world experience with USB 3.0 as well as dozens of IETF and IEEE standards, from Ethernet (IEEE 802.3) to DHCP (RFC 2131).
- In-depth knowledge of vision-specific standards, such as GigE Vision, USB3 Vision, GenICam™, and related conventions including Standard Features Naming Convention (SFNC) and Pixel Format Naming Convention (PFNC).
- Representing your company's interests as a member and active participant in the technical committees that develop these international standards.
- Monitoring and implementing changes due to continual updates to all of the above standards and conventions.

2 FPGA Design

Does your company have individuals that you can allocate long-term solely to the FPGA design of the interface? Implementing the standard interface in an FPGA can consume over one person-year, even when buying a MAC (USB3 or GigE) and network stack (GigE only) from an existing vendor. In addition to implementing the interface, the FPGA also needs to interface with the sensor electronics for configuration and triggering, and potentially with external devices like strobes and sorters.

Consider how intensive this FPGA design can be and whether it might be more efficient for your company to work with an experienced vendor who can provide an IP core targeted at FPGAs that includes:

- The standard interface (USB3 Vision or GigE Vision).
- A high-quality MAC and network stack (if GigE), pre-tuned for maximum performance.
- Provisioning for communication to the sensor electronics and external devices.

3 Hardware Design

Does your company have experience building products with the high-speed signaling that Gigabit Ethernet and USB 3.0 require? Even if your answer is "yes," would a schematic for the interface speed-up your development timeline?

Consider the advantages of working with a vendor that can provide you with:

- A schematic and associated Bill of Materials (BOM) that has been used in dozens of designs and thousands of units.
- An assessment of your schematic and a layout against field-proven designs to ensure they are correct and conducive to high-volume manufacturing.
- A BOM that uses commercial temperature components and also identifies compatible components with wider temperature ranges.

4 GenICam Compliance

Is your company prepared to take on the development associated with GenICam compliance? This interface, which presents a uniform API so that software applications can treat cameras from different manufacturers identically, is a requirement for both GigE Vision and USB3 Vision compliance.

While it might sound like a trivial task to create the GenICam XML file, a typical GenICam XML file is tens of thousands of lines long, and requires deep integration with your camera. Consider the advantages of a vendor that offers:

- Development tools to rapidly match features in the XML file to commands to the sensor and electronics.
- A standards-compliant SDK, in which the XML file is parsed and presented to the user both visually and via an API.

5 Software/SDK Development

A standards-based interface is more than just hardware; software is required for a full end-to-end solution. Software applications running on a PC, whether written by your company or your customers, must use an API to discover and connect to compliant devices, read and write configuration, and receive images.

Your company will need to allocate software engineers to the task of implementing this API. Alternatively, you can look to a provider who has a standards-compliant SDK which is:

- Compatible with multiple operating systems, such as Windows and Linux.
- Supported under multiple programming languages and development environments.
- Interoperable with compliant devices from multiple manufacturers.

6 Ongoing Maintenance and Enhancements

The "do it yourself" route means that your company will need to be prepared to keep up to date with the standards and the naming conventions as they constantly evolve. Further, as with any hardware design, components become obsolete over time and suitable replacements must be sourced.

Consider the peace of mind your company can enjoy with a vendor that:

- Automatically shares software updates that incorporate bug fixes, general enhancements, and changes due to changes in standards and naming conventions.
- Owns the responsibility for choosing compatible hardware component replacements.

7 Time-to-Market, Risk, and Opportunity Cost

Even if your company is willing to accept all of the costs and efforts discussed to this point, there are still the issues of time-to-market, risk, and opportunity cost.

An expert vendor can help give your company a competitive edge on all of these three fronts:

- **Faster time-to-market:** Understanding the standards, implementing schematics and FPGA designs, and creating (or licensing) an SDK all take precious time.
- **Lower technical risks:** A single mistake in interface implementation could be costly in terms of meeting a product development timeline.
- **Diverted opportunity costs:** Pulling your engineering team away from your core competencies to develop a standards-compliant interface could result in critical opportunity costs.

Final Calculations

If, after reviewing these seven critical considerations, you think there is value in working with a trusted development partner, we would be happy to share our experience with you and your company. Pleora has a successful track-record of helping customers around the globe to develop high-performance, cost-effective video interfaces for their products. In doing so, these customers have enjoyed the peace of mind that comes with cutting technical and schedule risks in development and integration cycles.

In a confidential one-on-one session, we can input your data into our detailed Total Cost of Ownership formula. There's no obligation, so why not put our experience on your side?

To schedule your session, simply email **marketing@pleora.com** or call **+1 613-270-0625**.

Video Interface Options

Pleora offers video interfaces as enclosed units, OEM boards, and Intellectual Property to suit your specific needs. We invite you to visit **www.pleora.com** to learn more.

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