

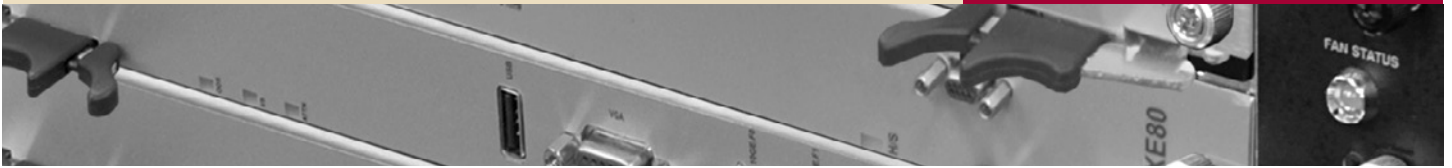


Telecom Hardware Moving Toward “Buy”

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Continually refining standards and the development of a healthy supplier ecosystem have steadily moved the telecom industry from proprietary to standards-based designs. As a result, network equipment providers (NEPs) are now in a position to avoid hardware design altogether and focus their development efforts on software-based value-added features. An evaluation of the make-versus-buy decision that considers the entire product lifecycle shows significant advantages on the “buy” side for everything from modules to entire systems.

The telecommunications market has experienced enormous changes in the last few decades, and the pace of its evolution is increasing. Twenty years ago vendors could reasonably expect that their system design would have an extended market lifetime. Now, however, demands for new communications capabilities are continually arising. Moore’s Law of computer technology advances seems to apply equally well to other areas of innovation: new capabilities seem to be appearing at an exponentially-growing rate.



This increasing pace of innovation has altered the traditional telecommunications market model. Rigorous market research, once the foundation of new product definition, is unable to keep up with changing market demands or predict new ones. No market research could have predicted the billion-dollar market for cell phone ring tones, for example, because the concept had no precedent. The new model for telecommunications mirrors what has proven successful in the Internet domain: “try it and see what sells.”

A second factor altering the telecommunications market is a steady erosion of the distinction between enterprise-level and carrier-class systems. Private branch exchange (PBX) systems and central office systems once had very different functional requirements. Now they differ more in scale than in behavior. As a result, more competitors are selling the same type of product. This has increased both competition among vendors as well as accelerating the pace of innovation and market change.

Performance Not the Driver

A byproduct of rapid market change has been a shift away from performance as the prime driving factor in market success. The ability to offer new capabilities and pursue new revenue opportunities quickly has become more important to telecommunications equipment customers than modest increases in bandwidth or call volume. Experience is showing that performance improvements need to exceed 20% just to get any notice. The first to offer a new feature, however, can gain market share and set the benchmark that all other competitors must then exceed (by at least 20%!) in order to recapture market share. Simply replicating a feature is not enough; the market perceives later introductions as imitative, not innovative.

As the market has changed, the requirement for proprietary system design has diminished. Numerous standards have arisen that

address the design of telecommunications hardware components and platforms, hardware and software interfaces, and middleware. Subsequently, many standards-based telecommunications system elements became available from multiple suppliers, shifting such elements from proprietary design opportunities more into commodity items.

What has evolved is a robust standards-based supplier ecosystem. The foundation is composed of organizations working both to address telecommunications system design needs as well as to ensure interoperability among standards-based building blocks. On the hardware front, for example, the PCI Industrial Computer Manufacturer’s Group (PICMG) has developed hardware standards covering a range of form factors for individual boards and modules.

Along with the standards groups, other industry organizations have arisen to provide coordination and guidance for areas such as platform profiles, high availability middleware, carrier-grade operating systems, and the like. One is dedicated to ensuring that these various standards bodies target the real-world needs of telecommunications service providers. Another, the CP-TA (Communications Platforms Trade Association), is working to ensure multi-

vendor interoperability among standards-based components.

Full Platform Purchasing

Under the guidance of these various organizations, a host of suppliers have developed a full range of standards-based products that network equipment providers can use as the basis of their product designs. Developers can choose to utilize individual modules, populate a standard chassis with a full array of modules, or even acquire a full NEBS-certified system platform upon which to deploy their software applications. The interoperability of these standards-based system elements fosters competition among suppliers, ensuring both low cost and rapid innovation.

The presence of this ecosystem and its product offerings has been driving the telecommunications industry away from proprietary design toward systems based on the purchase of standards-based equipment. According to a study from market researcher Venture Development Corporation (VDC), more than half of the Tier I equipment vendors and nearly three-quarters of Tier II and Tier III vendors are basing their next product design on PICMG’s xTCA (Telecommunications Computing Architecture platforms (see Figure 1).

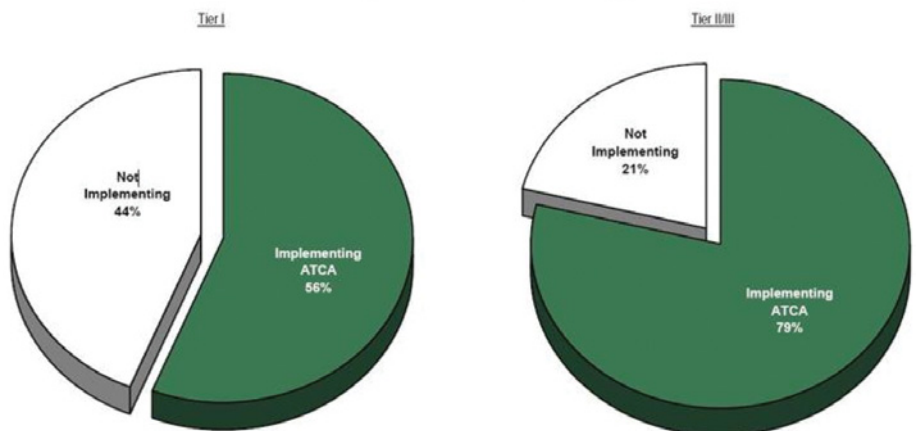
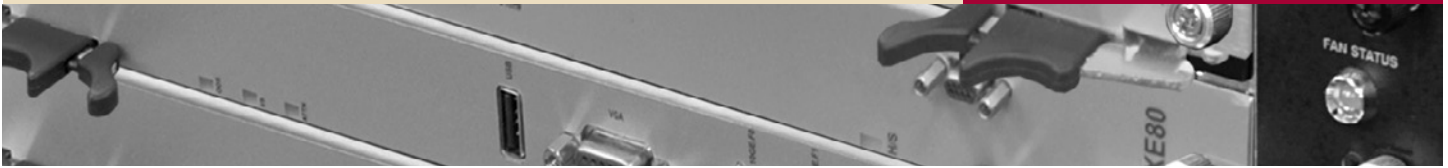


Figure 1. Market research firm VDC says that the majority of new telecommunications systems now use a standard-based design approach



There are many reasons why the old make-versus-buy decision is becoming “buy” for telecommunications equipment vendors. One is that the strategic validity of proprietary design has declined: purpose-built equipment is no longer essential for competitiveness. Instead, functional flexibility has become a key requirement, helping reduce the effort needed to keep pace with feature innovation. Software, not hardware, is the avenue to new features and applications.

Proprietary design also requires substantial vendor investment. Fixed costs include the need to maintain a significant hardware design team as well as manufacturing capacity, supply chain management, etc. Variable costs include parts inventory for both manufacturing and customer support as well as prototyping and testing costs during the design phase.

Reducing Opportunity Cost

Proprietary design also entails a significant opportunity cost due to its long time to market. Development of a new telecommunications system from scratch can take as long as 36 months, including hardware design, prototyping and debugging, and software development. Integrating standards-based modules from third-party suppliers rather than designing from scratch allows developers to cut 12 months from that timeline, adding many thousands of dollars to gross margin (see Figure 2). Adopting a fully-developed and certified system platform can cut another year from time-to-market and further increase margins by eliminating hardware design and integration, allowing in-house resources to focus on application software creation. If the application software simply needs porting to the new platform, product development can reduce to less than a year.

The main argument in favor of proprietary design is the opportunity it provides for hardware innovation. This places the

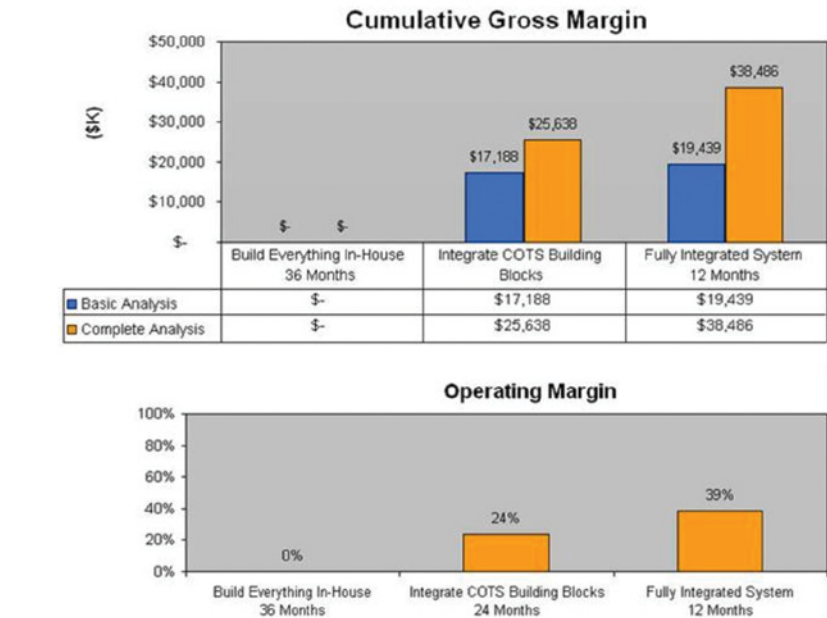


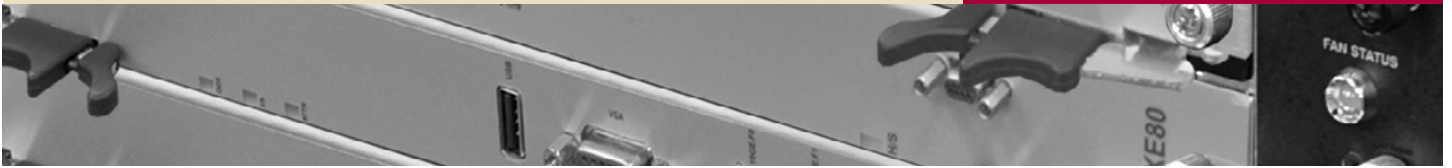
Figure 2. A lifecycle cost analysis shows that, despite the initial outlay, purchasing a system platform results in a greater return on investment than proprietary design

development team in a miss-matched competition with the standards-based supplier ecosystem, however. Individual company R&D expenditures cannot match the large cumulative investment of the supplier ecosystem, either in dollars or man-hours. Further, a proprietary design approach has the development team working in isolation rather than leveraging the collective experiences and accomplishments of others. With a standards-based design approach, on the other hand, a system vendor is free to concentrate its development resources on its main opportunity to add value: the applications software.

The other argument in favor of proprietary design – maximizing profit through vertical integration – is now being proven false. While the initial purchase of system hardware can seem intimidating, the payback in time to market (and hence market share) can offset much of that cost through increased revenue over the life of the project. In addition, the standards-based design approach reduces on-going cost throughout the product’s lifecycle.

Leveraging the Ecosystem

One on-going cost the standards-based design approach minimizes is the cost of keeping pace with technology improvements. Intel, for instance, releases a higher-performing processor every 6 to 12 months. Thus, it doesn’t take long before the performance level of a system in the field falls significantly below that of new equipment. To keep existing customers satisfied, system developers must provide regular upgrade opportunities. If the system is standards based, the upgrade can be as simple as purchasing a new module. This approach works because of the interoperability assurance guidelines that organizations such as CP-TA provide.



This ability to readily keep pace with performance improvements not only reduces product support costs, it adds to product longevity. The pace of innovation in telecommunications has become so fast that proprietary designs run the risk of becoming obsolete before the development investment has been fully recovered.

The extended market life that ready upgrades allow virtually eliminates that risk, however. The developer's return on investment (ROI) is thus improved by purchasing rather than designing from scratch.

Utilizing purchased components and platforms also allows telecommunications system providers to more readily keep pace with technology and feature evolution. The recent history of technology evolution shows that there is no way of knowing where in the system the next significant improvement will be required. It is virtually impossible, not to mention extremely expensive, for a vendor to maintain expertise in every aspect of telecommunications system design so that its products can maintain leadership or even parity in the market.

Basing the system on purchased modules and platforms, however, gives the vendor access to the entire supplier ecosystem, which ensures the needed expertise is available. Vendors also gain access to the ecosystem's development efforts, allowing rapid acquisition of new features as they become popular.

Clearly, then, the telecommunications equipment market has changed dramatically. It is now hyper-competitive and fast-paced, placing significant burdens on development teams. Fortunately, the advent of robust standards, equipment based on those standards, and multi-vendor interoperability among products from the ecosystem now provide system developers with a compelling “buy” alternative. In the face of rapid market changes and the time and cost advantages of purchased system components and platforms, then, proprietary hardware design is no longer a sustainable approach for telecommunications equipment manufacturers.

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