

# Exploring the Business Model Evolution of High-Tech Equipment Manufacturers



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## Executive Summary

Today's equipment manufacturers are experiencing the all too real challenges of competing in a tough economy and an increasingly crowded marketplace. With reduced component pricing lowering the barrier to entry, competitive espionage and theft of trade secrets, and declining product differentiation, it is no surprise that many equipment manufacturers are facing commoditization and price erosion. If that is not enough, the down economy has companies around the globe searching for new ways to increase revenue and at the same time, reduce headcount, inventory and operational costs. So how do today's equipment manufacturers stay competitive and differentiate their products in a crowded market? How do they avoid competitive threats and still provide innovative products with added value for their customers?

This paper discusses some of the challenges faced by today's high-tech equipment manufacturers and goes further to uncover the evolution that has been taking place over a number of years. Modern high-tech equipment manufacturers are transitioning from what was once a pure hardware-based business model to a software-based business model. This paper goes further to illustrate some of the tools and methodologies that enable continued innovation, competitive advantage, better control of operational costs, and increased revenue, by providing real added value for end users.



## Introduction

If you are in the business of selling software-driven equipment for medical imaging and diagnostics, digital printing, sophisticated surveillance systems, coin-operated gaming and casino gambling, or any other internet-enabled hardware device,, you are probably already deeply involved in the evolution from a pure hardware manufacturer to a software vendor. You sell hardware, but most likely your current products are based more than ever on off-the-shelf computers and components. An increasingly important part of the value you bring to your customers – and competitive advantage – is in the software you provide, rather than in the hardware, as it was in years past. In fact, when you look at your organization, the ratio of software engineers to hardware engineers is continually growing in favor of the software engineers.

You're likely past the stage of wondering whether or not your business will become a software company; it is clear to you that the inevitable process has begun, hardware is being commoditized and, going forward, you will base your business more and more on software. It's a long process that started years ago, it is likely to take many more years before the transition is complete and your company has moved entirely to software.

## Challenges Faced by High-Tech Equipment Manufacturers

Although moving to a software business model makes your company much more competitive and enables you to create significant competitive advantages, it also encompasses significant challenges and risks.

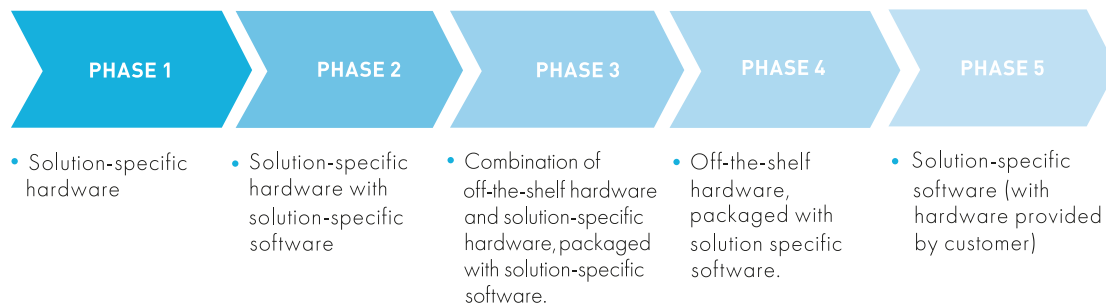
In the past, theft of your Intellectual Property (IP) involved reverse engineering and cloning of your unique machine design and then building a production line to manufacture similar equipment – not a small undertaking. These days, a significant part of your hardware product is based on off-the-shelf components, and the lion's share of your IP resides in the software developed to drive that hardware. Now the barrier to stealing your IP and producing similar solutions, which are based on years of your investment, is significantly lower, and has perhaps even completely disappeared.

As you incorporate more and more competitive advantages into your software, and your investment in software development increases, you want to monetize that investment by winning more customers. You want to assure that your business maximizes the profit from your investment in creating these competitive advantages, and you want to make these advantages last as long as possible.

Another challenge that no doubt has crossed your mind is how to better serve and expand your markets by offering a range of solutions in different price points on one hand, while on the other hand reducing overhead as much as possible by scaling back the number of different hardware and software configurations you produce.

## The Shift

Shifting from an equipment manufacturer business model to that of a software company does not happen overnight, and typically occurs in phases. These are the common phases that take place during the transition from equipment manufacturer to software vendor: As a somewhat natural progression, companies that reach phase three typically start offering added value software packages in addition to their traditional hardware-based offering.



For example, imagine a professional printer manufacturer that started their company in phase one by manufacturing printing equipment. Over time, their technology evolved to digital printing and their equipment became more sophisticated. In phase two, they were using a simple processor running dedicated software. The need to add value to their offering, and the decreasing cost of x86 processors, drove them to embed a PC-based computer in their printing equipment; putting them squarely in phase three. Having a powerful computer embedded in their equipment enabled this printer manufacturer to add more value over time by continually enhancing their software. By this time, they had a large team of software developers in-house, and recognized the potential in expanding the business by developing pure-software products to sell to their customer base.

It is inevitable that, with the reduction in manufacturing costs in emerging markets and the entry of Asian competitors, this printer manufacturer will experience erosion of profitability on their hardware products, and as a result, will shift their focus to software.

## Traditional Solutions

The shift is unavoidable. In today's high-tech world, companies that have not successfully moved from phase one to two, have probably already gone out of business. Companies that have evolved and are now in phases three, four, or five, are facing the challenges described earlier in this paper:

- Competitive advantages have a short life-span as a result of Intellectual Property theft.
- The ability to support an expanded product line using a single codebase for increased organizational efficiency.
- The ability to monetize the value added by an increased software development investment.

As your company progresses through each phase, you can expect to be exposed to more of these challenges.

To overcome these challenges while moving to phase three, companies have traditionally integrated copy protection into their products using hardware keys (dongles). Typical hardware-key solutions provide off-the-shelf IP and copy protection, and enable equipment manufacturers to build a secure licensing mechanism. The licensing mechanism enables vendors to sell a range of products, based on a single codebase, and enables them to monetize the value-added features. The IP and copy protection mechanisms enable vendors to avoid cloning of their products, and thus maximize the life span of their competitive advantages.

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Hardware keys are the classic and most efficient solution for companies in phase three because they are simple to use, highly secure, and typically, very reliable. As long as the deliverables of companies in phase three are still completely physical, hardware keys are the best match for their distribution model – they simply attach the key as a component within the equipment. A typical implementation keeps the equipment's software license information in the key's memory. In the event of an equipment failure, the use of a hardware key enables field technicians to replace the embedded computer while maintaining the same key with the customer's license information. This avoids a potentially problematic situation that would exist if communication to the vendor's back office, for the purpose of software license transfer, is not possible.

If your company is in phase three, it is likely that you already have a hardware key integrated into your products.

But what do you do when the need arises to provide additional value to your customers by adding pure-software products to your offering? Obviously, you need to ensure that your investment in software development pays off, and that you are reimbursed for every copy of your software. You also probably see the need to protect the intellectual property and algorithms that your engineers have embedded in your software, and to maximize the duration for which your software is considered cutting edge and revolutionary.

These days, most software products are distributed over the internet. Protecting and licensing your new software product with a hardware key may appear to be the easiest and most straight forward step to take, given that you already have a hardware key in your other products. However, this method may cause some distribution difficulties in a world where users expect to be able to download the software and start using it right away.

For that reason, companies reaching the point of adding pure-software products to their offering typically choose to employ a software-based licensing system for their pure-software products, by either buying an off-the-shelf system, or by implementing their own. Over time, companies that implement their own system frequently discover that they are investing a disproportionate amount of their software development and support personnel's time in maintaining, enhancing, and supporting their home-grown licensing system instead of focusing on their core competence. Such companies typically end up buying an off-the-shelf solution.

The disadvantage in the approach of employing a software-based licensing system is that those companies end up with two licensing systems; a hardware-based solution for the software embedded in their hardware products, and a software-based solution for their software-only products. This adds complexity to their back-office systems and complexity to the licensing and security code that is embedded in shared software components; resulting in increased maintenance and operational costs, and lack of flexibility for changes to their business model.

## Modern Solutions

Modern licensing platforms overcome these weaknesses by enabling similar licensing schemes in both hardware keys and software licenses. The more advanced platforms are designed to enable vendors to change from a hardware key to a software license, without changing their product code. These modern platforms typically contain numerous out-of-the-box business models, so that typically complex licensing implementations can be spared.

By using such a platform, you provide your company with the freedom to progress through the transitional phases without encountering the challenges discussed in this paper. Regardless of the current phase in your company's evolution (producing computer-based equipment, selling software add-ons to the equipment, selling stand-alone software in addition to the machine, or moved entirely to software), integrating a flexible licensing platform enables you to advance your business from one phase to the next when your business needs it, rather than when your security system is ready for it.

## Closing Thoughts

Equipment manufacturers that embrace this transition from a hardware to a software business model using the tools and methodologies described in this paper will be able to vigorously pursue greater market share and reduce manufacturing and inventory costs, while ensuring they're protected against competitive threats to their IP. They will also be able to more cost-effectively expand their product lines and bring innovative new devices to market. In short, those vendors making the transition to a software business model will be more nimble and better positioned for the future.

## About Thales

The people you rely on to protect your privacy rely on Thales to protect their data. When it comes to data security, organizations are faced with an increasing number of decisive moments. Whether the moment is building an encryption strategy, moving to the cloud, or meeting compliance mandates, you can rely on Thales to secure your digital transformation.

Decisive technology for decisive moments.



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