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**Business Models That Last:
Balancing Products and Services in
Software and Other Industries**

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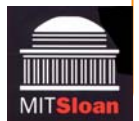
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Business Models That Last: Balancing Products and Services in Software and Other Industries

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Entrepreneurs and managers in software and many other technology-driven businesses such as computer hardware, telecommunications equipment, and industrial machinery, often debate which is the best business model: that of a *products* company or a *services* company.¹ People generally come out in favor of being a products company, particularly in software. The reasoning seems easy to understand: In many industries, companies can standardize products and either have minimal costs to mass-produce those products or can benefit from large economies of scale and other efficiencies, such as automation in design. When there are large scale economies or other ways of achieving efficiencies, profit margins on a products business can become dramatically higher compared to services that require labor-intensive time with each customer or expensive customization work for each sale.

A common assumption underlying the preference for a products-oriented business model is that a company cannot easily offer both standardized products and customized services and be equally good at such different kinds of businesses. One argument is that products companies are usually better at creating designs or features for general users rather than accommodating the needs of a specific customer. Another argument is that services companies seem to fail much of the time when they try to generalize what they know and create standardized products for mass markets.²

The past decade has been a good to great time for technology companies, at least before 2001. During these years, I believed – and I think most venture capitalists, managers, and entrepreneurs also believed – that it is much better to be mainly a products company. I no longer think this is true. Products and services are fundamentally different, but the strategic choice for managers is not so black and white.

In fact, to create a viable business model that lasts in both good times and bad times, many technology companies need to cultivate both products and services, and offer “hybrid solutions” that combine the two. But whatever your position on this question, the difference and interrelationship between products and services is the first thing that managers and entrepreneurs need to grasp if they want to understand how to build a viable business for the long term in any industry where companies sell complex products that are difficult or undesirable to standardize for every customer.

How Products and Services Businesses Differ

In my definition, to be mainly a *products company* means that the majority of a firm’s revenues come through sales of standardized offerings. In the case of software, “products” are usually “shrink-wrapped” programs named for the plastic wrapping that used to cover boxes containing floppy disks or CD-ROMs. Companies like Microsoft (the leading vendor of PC operating systems and desktop productivity applications), Adobe (the leading vendor of printer and digital imaging software), and Intuit (the maker of Quicken, TurboTax and other financial software for individuals and small businesses) are perhaps the best known examples of software products companies. There are potentially large marketing, support, and maintenance costs associated with a large user base. But, in general, it costs roughly the same to make one copy or one million copies of a software product because the product is replicated digitally. Therefore, you would be a fool not to want to make and sell a million copies of every software product you create.

Other types of businesses have different cost structures and the marginal cost of producing additional copies of a product vary greatly. But the basic idea of standardizing a product offering in order to benefit from scale economies is as old as mass-produced firearms from the 19th century and the original Model T Ford from the early 1900s.

Products companies ranging from computer hardware makers to automobile producers generally want to sell as many copies as they can of their products *as is* – that is, without adding special changes such as one-of-a-kind features for individual customers. But some firms in a broad variety of industries, ranging enterprise software to telecommunications equipment, machine tools, and certain types of semiconductors, get heavily into not only *customizing* their products for each customer (which can be managed efficiently with modular designs and flexible manufacturing facilities, as discussed in the “mass customization” literature³). They also get into providing a variety of services, such as technical support, training, and integration work with other products.

Enterprise software companies (i.e., software companies selling software products and services to other companies rather than to individuals) also sell large amounts of *maintenance* (special product enhancements as well as regular product upgrades sold under long-term contracts). If firms go in this direction of providing more customized features, services, and maintenance than they do standardized products, then the more people the company is likely to need, the more unique projects or labor-intensive work it will probably undertake, and the more the firm leans toward becoming what I will call, for short, a *services* company.

In the software business, companies like PricewaterhouseCoopers, EDS, Accenture, Cap Gemini Ernst & Young, Infosys, and Tata Consulting are well-known examples of traditional IT services firms. All their revenues come from services, including custom-built systems, although they rely heavily on reusing partial products for different types of applications. Some other software vendors that we often think of as products companies, though, are awfully close to the services business model. For example, PeopleSoft (a leading vendor of enterprise applications such as for human-resource management), SAP (the world’s largest vendor of enterprise applications ranging from financial planning to factory management), and i2 Technologies (a leading vendor of supply-chain management software) now have the vast majority of their revenues coming from services and maintenance contracts. They are not “pure” services firms in the sense of a PricewaterhouseCoopers or an Accenture, although neither are they “pure” products companies in the sense of a Microsoft or Adobe, which have 99 percent or more of their revenues coming from packaged products.

In other high-tech areas, companies such as IBM and Hewlett Packard offer large amounts of services and maintenance for their hardware and software products (Table 1). In 2002, for example, 45 percent of IBM’s \$81 billion in revenues came from services such as management consulting and IT outsourcing. This figure compares to only 18 percent of revenues coming from services in 1995. For its software products business, which accounted for 16 percent of total revenues in 2002, IBM had gross margins like other software companies, of about 84 percent – much higher than for services (26 percent) or hardware products (27 percent). But IBM sold far more hardware products ranging from mainframe computers to laptops) and services than it did packaged software products (such as database products and web application servers), and this restricted its ability to generate higher profit margins as a company.

Table 1 about here

At Hewlett-Packard, 18 percent of its \$56 billion in 2002 revenues came from services such as technical support, IT consulting, integration work with various computer systems, business portals, and web services.⁴ This compared to only 14 percent of revenues in 1995. HP's gross margins for services also exceeded margins for products (which ranged from desktop and laptop computers to printers) by several percent – 33 to 25. At Cisco, the world's leading vendor of Internet routers and a major producer of other networking gear, nearly 18 percent of \$18.9 billion in 2002 revenues came from services, compared to a negligible amount in 1995. Cisco's services, which also had higher gross margins than its hardware business (70 versus 62 percent), focused on technical support and consulting on how to build better telecommunications networks.⁵ At EMC, the world's largest storage-devices maker, 22 percent of its \$5.4 billion in 2002 revenues came from services such as solutions consulting, interoperability testing for various storage devices, training, and technical support.⁶ Services in 1995 accounted for only 2 percent of revenues. EMC also had higher gross margins on services compared to its hardware systems, which included embedded software (34 versus 30 percent).

At General Electric, the world's largest diversified technology and services company, \$75.5 billion (57 percent) of nearly \$132 billion in 2002 revenues came from services, including \$54 billion in revenues from financial services alone. In contrast, services for GE in 1995 accounted for only 51 percent of revenues. GE's service offerings in 2002 covered a broad range: product support and maintenance; electrical apparatus installation, engineering, repair and rebuilding services; computer-related information services; network television, cable, Internet and multimedia programming and distribution services (through its NBC subsidiary); and, through its General Electric Capital Services subsidiary, a broad array of financial and other services including consumer financing, commercial and industrial financing, real estate financing, asset management and leasing, mortgage services, consumer savings and insurance services, and specialty insurance and reinsurance.⁷ Again, as shown in Table 1, GE's services business had superior gross margins to its products business (34 versus 30 percent).

Even companies known for their standardized hardware products are offering increasing amounts of services, even though the revenues are not yet large enough for the companies to report them in financial disclosures. At Dell, for example, the company complements its PCs, servers, and storage products with a growing range of IT outsourcing or management services, deployment services, IT consulting, and technical support.⁸ Intel offers technical assistance and customization services to help customers use its microprocessor-based products in a growing range of areas, such as web services, wireless, storage, and telecommunications applications.⁹

Service Revenues Help in Bad and Good Times

The rising importance over the past decade and the high margins of service revenues at some companies reflect a certain reality of the business cycle. In bad times, customers (individuals or enterprises) may decide not to buy new versions of the products they are using, whether it is a software program or a new automobile. *This potential failure to buy puts the revenues and profits of many products companies at risk when times are bad.* At

least, this observation seems true in the short-term, compared to companies that have lots of long-term contracts for predictable services or product replacements. It does occur that enterprise customers renegotiate service contracts downward if retail prices of the products they are buying decline. But, in general, many product sales to corporations and individuals are subject to fluctuation because they are so *discretionary* in nature.

Because product sales are subject to buyers just “saying no,” many companies find that a balance of product and service revenues helps them survive in bad times and grow sales in good times. The software business may be an extreme case, but it illustrates what can happen to companies that become too dependent on product sales and do not fully exploit the potential of services.

For example, many enterprise software companies *double or triple* their revenues over time through accumulation of contracts for services, including maintenance, even if new product sales lag behind in growth rates. This is because software companies selling to large corporate customers can generally get up to a dollar in service revenues for every new dollar in software product revenues (called “license fees” or “subscription fees”) for the first year or so of a new sales contract. They can also expect to get between 15 and 20 cents in annual maintenance fees for every dollar of license fees – for the period that the customer uses the product.¹⁰

Many enterprise software companies offer *perpetual* licenses to their customers as well – that is, the customer, as long as it pays the agreed-upon annual maintenance fee, has the right to upgrade to new versions of the software, with an occasional special charge, for example, to accommodate hardware platform changes or expansion of usage rights. Therefore, *over the lifetime of many enterprise software products, 70 percent or more of the total cost to a customer may come from service and maintenance fees and only 30 percent from the original product sale.*¹¹ The percentage from maintenance can become especially high for products in usage for a decade or more. If a software company sells a lot of products early on but then fails to keep up a high rate of new sales to new customers, it will inevitably see the majority of its revenues shifting toward services and maintenance coming from the installed base.

Logically, the same thing should be true for companies selling everything from computer hardware and telecommunications equipment to computers and automobiles. If customers stop buying new versions of existing products, the vendors will have declining or zero new sales, unless they offer services after the sale, or enter new product lines.

The Business Models Are Very Different

Of equal importance, in bad times, it may turn out that the *only* revenues and profits a company can really bank on are from services and maintenance contracts. This is why some people refer to the business model of services-oriented companies as being somewhat like that of a *bank*. Their installed base of users, along with long-term contracts for services (including maintenance of previously sold products) to be rendered in the future, are akin to a bank with assets on deposit generating a steady stream of interest. In contrast, because they can replicate copy after copy with minimal marginal costs, the business model of products companies with minimal marginal costs of production, like software companies, is more like that of a *printing press*.

I noted earlier that there is a *hybrid solutions* model – companies that evolve to a point where they sell a mixture of products and services, including maintenance upgrades

and maintenance of special product enhancements (Figure 1). Companies like IBM, Hewlett Packard, Cisco, and EMC are good examples of hybrid solutions companies in that they offer a variety of hardware, software, and services to meet different customer requirements.

Figure 1 about here

In enterprise software, PeopleSoft and SAP are in the category of hybrid solutions providers, though we should add Oracle, Siebel, i2 Technologies, and many other software companies that used to have high products revenues but no longer do. Hybrid solutions firms as well as software services firms that sell custom or semi-custom systems for enterprise applications both resemble the “bank” business model with assets on deposit, in contrast to the “printing-press” model for software products companies.¹²

Another reason why technology companies may have high service revenues is that their products are often too complex to package as “off-the-shelf” offerings. As a result, they sell “solutions” that require customization or special integration and installation work. It is usually very difficult for enterprise customers to switch from this type of tailored solution. Consequently, there is usually a technical “lock-in” effect that keeps customers tied to particular software vendors for long periods of time.

A Healthy Tension

Technology companies, especially young ones, often seem to struggle unnecessarily with the products versus services debate. The reason is that having a hit product in many businesses is like having a best-seller book. Book publishers can make enormous profits from just one best-seller. In practice, though, it is probably just as hard to create a best-seller software product, laptop, or automobile design as it is to write a best-seller book. It seems even harder to follow that one hit product with a continuous stream of new products (the sequel business) that sell in both bad and good economies.

Most successful technology companies at some point will have to deal with the challenge of saturated markets where customers already have enough or “good enough” products. Hence the tension that inevitably emerges among many companies with a strong products business: *They know they must move eventually toward selling more labor-intensive services, even if services have lower profit margins, depending on the level of price competition for their products.*

And the struggle is more complicated than this. Products companies that want more revenues from services generally get those revenues from service contracts to support their new product sales. They can sell services to old customers, to be sure. But the pipeline of potential service revenues will rise or fall in proportion to the rise or fall in new product sales, albeit with a lag of a couple of years, unless the company can decouple services from product sales (which a few firms, such as IBM and SAP, have managed to do). Therefore, most hybrid solutions companies with a strong services business *must* think more about selling products, despite the more sporadic and non-recurring nature of product sales.

It is also possible for products companies to gravitate too much toward services and ruin the potential of their products business. For example, when technology companies are first starting out, or in bad economic times, they usually have to scramble to make a

sale. Customers usually want specific features that meet their particular needs. But, over time, a company that prefers to sell a standardized product might saturate this market and start offering customers special enhancements. This strategy leads to selling customized versions of the products, one at a time. The service portion of a company's revenues, and the cost of these revenues, start to rise dramatically. Maintenance also becomes more complicated because the product upgrades may have to include the special enhancements done for individual customers.

We can see some of these trends in the financial data reported by leading enterprise software companies. Figure 2, for example, tracks eight firms between 1992 and 2002. The IBM data reflect software products and services sales, and exclude hardware sales. What we see is that service revenues have been growing in absolute terms relative to product sales and in some cases have exceeded product sales. This occurred at Siebel, the leading vendor of customer-relationship management software in 2001, PeopleSoft in 1998, i2 in 2001, IBM before 1992, SAP in 1997, Oracle in 1998, and Compuware, a leading vendor of mainframe applications software and services, in 1993 or before.

Figure 2 about here

Figure 3 contains more data on these software companies. The charts in the upper right corners break down the revenues for each firm during the technology boom and bust years of 1999 to 2002, using 1999 revenues as an index of 100. This analysis shows even more clearly how important rising or at least more stable service revenues have been to these companies. The bottom line is that the distinction between a products company and a services company, at least in the software business, is not always clear or desirable. In many ways, hybrid solutions companies may have the best business model – they can generate scale economies from sales of standardized products but they can also generate more predictable and recurring revenues like services companies. And, over a few years, they can double or triple what their revenues would have been with little or no services.

Figure 3 about here

You Still Need to Choose

Though a hybrid solutions model can be effective at generating a steady stream of revenues and profits, managers still need to choose a primary strategic orientation *and* understand the potential consequences of their decisions. The reason is that selling products to new customers requires very different strategies, organizational capabilities, and financial investments compared to selling mainly services and product upgrades to an existing customer base.

Many products businesses are mainly about *volume* sales – selling or licensing the most copies or units you can of a standardized product, whether it is a copy of Windows or the Toyota Corolla. The basic growth strategies here are scaling or duplicating what you have done in similar markets. In the software business, Microsoft has set the model for firms of this type: become the market leader through volume sales and set de facto technical standards that “lock in” customers because their software applications and databases only work on a particular operating system or hardware platform. The

development organization needs to focus on creating a stream of new products and upgrades that appear at regular intervals with standardized features “good enough” for the largest possible set of users. Mass marketing and distribution skills are critical. Part of the strategy for a products company might also include trying to become a platform leader, though most software companies create *complements* – products that work with and add value to a particular platform, like a Windows PC or Unix workstation, or a handheld device powered by the Palm or Symbian operating systems.

Services businesses are mainly about people and building specific (not general) customer relationships. In the software business, companies like IBM, PricewaterhouseCoopers, Accenture (formerly Andersen Consulting), and Cap Gemini Ernst & Young have set the standards here. A number of Indian companies (Infosys, Tata, Wipro, Satym) have also come on strong as global competitors bidding for custom IT jobs. Hitachi, Fujitsu, and IBM Japan are leaders in this field in the Japanese market. These types of services are not scale businesses. But services companies can be strategic as well as efficient. It is usually important to mix senior with junior people to maximize profits for any given client project, although the danger here is for a services firm to do this without damaging the relationship by having inadequately skilled people on the job.

For products companies, again, the lure is potentially enormous *scale economies* that come from selling multiple units of the same item. For services companies, *scope economies* are the holy grail to strive for, and these are more illusive. They can come from structuring knowledge such as how to determine customer requirements, manage projects, customize product features, conduct user acceptance testing, or reuse design frameworks and even pieces of products across different projects for different customers. Scope economies can also come from clever account management – forming relationships with particular customers where they buy a lot of your products and services over time.

Enterprise Software: A Case in Point

Basic Financial Metrics

In enterprise software, as in most businesses, products companies are usually much more attractive to stock-market investors and venture capitalists because of their potential for scale economies, rapid growth, and high profit margins. Industry analysts in particular usually place a great deal of value on *the percentage of a software company’s revenues that come straight from licensing fees (i.e., product sales) and the growth rate of this percentage over time*. To be sure, this metric is not an absolute measure of financial health or growth potential. As we saw earlier, some software companies have steady service revenues (including maintenance) and depend on these to generate consistent growth or stable sales. In contrast, other software companies may see their product sales fall faster than services revenues, especially in bad times, requiring hasty and often dramatic downsizings. Nevertheless, software industry analysts use this measure to get some idea of how labor-intensive a company’s business is and how easily it might scale up revenues and profits in the future.

Another measure of health for a company is *sales productivity – revenues per employee*. Many software executives believe these revenues should average at least \$200,000 per year for a products company to have a profitable business. It is a crude rule

of thumb, and companies can have high sales productivity and still lose lots of money by overspending in R&D, sales and marketing, or general administration to generate those sales. But it is usually a sufficiently large sum so that a company can hire enough people to staff critical functions and invest adequately in product development.

Again, high revenues and profits per employee – and low costs relative to revenues – are much easier to achieve if you have a best-selling product that you can make copies of for pennies and sell in units of thousands or millions (like Microsoft). It is harder to do if your revenues come from costly and labor-intensive maintenance and other services, or custom work with sales of a much smaller number of units. Firms that rely heavily on services cannot charge too much because many companies (including many technically excellent low-cost firms in India) can do custom software development and enhancements or perform other IT-related services. Customers with large IT departments like commercial banks or financial services firms also can do a lot of the customization work themselves. Obviously, the ability to charge high product fees can dramatically affect scalability of revenues and sales productivity. Software vendors that do mainly custom development or service work can also make lots of money, but only as long as they hire lots of people.

We can see these forces at work in Table 2, which compares 2002 data from the software companies discussed earlier. Of these firms, only Business Objects (the leading producer of business intelligence applications), Microsoft, and Adobe are clear-cut cases of software products companies. Oracle, Siebel, and i2 used to be products companies a few years ago, but are now much more oriented toward providing services and maintenance upgrades to an installed base of users rather than selling new products to new customers; they have become like SAP, PeopleSoft, and Compuware. My definition is simple: As suggested in Figure 1, *a products company should have well more than half its revenues (around 60 percent) coming from new sales of software products* (software license fees, excluding product update fees included as maintenance or product support).

Table 2 about here

It is not a coincidence that the companies with the highest sales productivity and profit rates – Microsoft (which does not break out services revenues) and Adobe (which only began declaring services revenues in 2002) – sell mainly products rather than services. Equally important, their products are unique and serve more as “platforms” or foundations for other companies to build products and services around.¹³ For example, many companies build applications on top of Microsoft Windows and Office; and many companies provide information through Adobe Acrobat. More data on more software companies would be useful to see how well these points about products and platforms hold. My basic argument, however, is mainly about potential: *In an ideal world, companies with higher percentages of new product sales should have more growth and profit potential, especially in good economic times.* It is much easier and cheaper to expand revenues and profits by selling copies of a standardized digital product than to expand by selling labor-intensive services or even discounted product upgrades.

Products Companies Become Services (or Hybrid) Companies

At the same time, we know that companies selling standardized software packages can also lose lots of money or see their profits and sales decline dramatically. Sometimes this occurs when their products become commodities and competitors emerge that drive down prices. This situation leaves firms that offer high-end custom or semi-custom solutions in a better position than the products companies that cannot differentiate themselves. The other problem, as noted earlier, occurs when the market becomes saturated or the economy turns bad: Customers stop buying new products or postpone purchasing decisions. Some companies, like i2 and Siebel, seem to get caught in the middle of a transition. Their financial reports suggest that both companies geared up for high-volume product sales during the late 1990s, with lots of people hired in R&D, sales, and marketing. Then they encountered low-priced competition and the economic slump. New sales to new customers required steep cuts in prices or creating complex deals of multiple products that proved expensive and difficult to install.

When times are bad for new product sales, software companies are left with services-oriented revenues or maintenance. If times are sufficiently bad, or if their markets are sufficiently saturated with products, then the *products companies may become services companies*. We can see this trend as well in Figure 3, which presents graphs on the left-hand side detailing revenues coming from services and maintenance (that is, all sources except for new software license fees) at the eight companies cited earlier, usually from their first public data in the United States filed with the Securities and Exchange Commission. Between 1993 and 2002, Business Objects went from 18 percent services and maintenance to 46 percent; i2 went from 34 to 71 percent during this same period. Siebel went from 5 to 57 percent during 1995-2002. Between 1992 and 2002, PeopleSoft went from 30 to 73 percent and Oracle from 40 to 64 percent. Even firms that had a strong services orientation before the 1990s saw a shift to services: IBM went from 58 to 74 percent (excluding hardware revenues) and Compuware from 62 to 76 percent. SAP, during 1997-2001, saw its services and maintenance revenues go from 50 to 69 percent.

The bottom graphs in Figure 3 show what this shift in revenues from products to services looks like in percentage terms. The two trend lines are, by definition, mirror images of the other; the data excludes revenues that are not software products or services and maintenance. What we see, though, is the same crisscross pattern we saw in Figure 1, as services revenues eventually exceed product revenues (Siebel, i2, PeopleSoft, Oracle, SAP). Business Objects seems headed in the same direction. IBM and Compuware have already crossed this threshold sometime in the past before 1992.

Enterprise software companies generally understand the need to tailor products to individual customers, and they usually learn how to charge adequately for their services or go out of business. As a result, they are more oriented toward services and hybrid solutions than products, even in their early days. We can see this at PeopleSoft, founded in 1987. This company introduced a low-priced human-resource management product that ran on personal computers rather than bigger machines. Over time, PeopleSoft has moved to a broader product line, added more industry-specific features to a growing product set, and, not surprisingly, placed even more emphasis on services.

SAP may appear to be an exception to the rule that products companies are better poised for rapid growth compared to services-oriented companies. It sells high-end enterprise planning applications that require extensive consulting, training, and

maintenance contracts. It has generated a lot of new business from services, which have grown faster than product license fees. SAP revenues rose 2.5 times between 1997 and 2002 (about \$2.7 billion to \$6.9 billion). However, *average headcount at the company also rose exactly 2.5 times*, from 11,558 to 28,604.¹⁴ So SAP is not an exception: *Europe's largest software company has grown rapidly by rapidly hiring – a trend that cannot continue forever.* Compuware and PeopleSoft, as well as IT consulting firms, are largely in the same position: If they grow, it is mainly by growing headcount. I will also say, though, that a hybrid solutions company has a greater chance of ramping up product sales (perhaps with a new release) and growing more quickly than a pure services company.

In short, *for most enterprise software companies, the two sides of the business – products and services – are impossible to separate completely.* Most corporate customers demand services (including maintenance contracts with a regular schedule of upgrades) along with the new software products. In addition, it does not seem easy to evolve from services to products (as the majority of revenues), at least not without making major acquisitions and changes in the mental model of the business and in personnel. Software companies usually evolve the other way around, like Business Objects, i2, PeopleSoft, Siebel, and Oracle, from selling mostly products to selling increasing amounts of services and maintenance.

Even Microsoft – the premier mass-market packaged software company – discovered the value of services when it wanted to increase sales of Windows NT and what it used to call its “BackOffice” products. It decided to create a solutions group in-house to help large customers and third-party firms install the enterprise version of Windows as well as new servers, e-mail, and corporate collaboration products. For many software products companies, services such as customization, installation, and integration support are necessary to drive new product sales. Service revenues and costs are not yet high enough for Microsoft to separate these from other revenues. But with increasing sales of enterprise systems and revenues from MSN, and the purchase of Great Plains Software in 2001, service revenues have been rising. For example, Microsoft reported that Enterprise Service revenues rose 34 percent in fiscal 2001, compared to the previous year.¹⁵

Dramatically Different Profit Margins

But what is most striking about selling software products compared to services is the *relative gross profit margins*. For example, at Business Objects (see Table 2), selling \$244 million in product license fees in 2002 consumed only about \$3 million in directly attributable costs – a gross profit margin of nearly 99 percent! The cost of software license fees mainly consists of materials such as compact discs and printed manuals, packaging, freight, inventory, third-party royalties, and amortization expense related to capitalized software development costs. (Generally Accepted Accounting Principles allow software companies to write off certain costs over a period of time corresponding to the estimated useful life of the product, such as eighteen months or three years, and deduct these capitalized expenses from current R&D costs on their income statements.) In contrast, Business Objects' service revenues of \$211 million in 2001 consumed over \$71 million in costs (expenses related to technical support, consulting, training, and other services), for a gross profit margin of about 61 percent.

Gross margins are of limited value as a metric. Business Objects, for example, in addition to direct costs for its license fees in 2002, also had current R&D costs of about \$75 million or 16.5 percent of sales. Most of this expense went to product development that would generate new licenses in the future, and some went into engineering and testing services. In addition, related more to current expenses, Business Objects in 2002 had sales and marketing expenses that equaled *nearly half of total revenues* (49 percent or about \$222 million). These expenses went both toward selling products and services. It is a big percentage compared to other software companies discussed in this chapter, except for i2, which is at a comparably high level of sales and marketing expenses relative to revenues. Both companies have such high sales and marketing costs because of high headcount, to be sure. But the headcount is relatively high because their revenues are relatively low – a scale economies problem. By contrast, in 2001-2002, Microsoft’s sales and marketing expenses were merely 19 percent of revenues. The other companies listed in Table 2-2 (Oracle, SAP, Siebel, PeopleSoft, Compuware, Adobe) had sales and marketing expenses ranging from 23 to 36 percent.

But, even though we need to look at total costs for selling products or services, the gross profit margin numbers illustrate how much more profitable product sales are as opposed to services in the software business. The numbers Business Objects achieved are not unusual. Siebel had a gross profit margin of 97 percent on license sales in 2002. Oracle seems to be at 100 percent and does not even report license costs separately. PeopleSoft and Compuware were over 90 percent. i2 had a lower margin – 85 percent – but this was still high compared to services (40 percent in 2002). High license costs generally come from amortizing development expenses, or absorbing costs when fixing bugs in the field or reconfiguring customers’ systems, without being able to charge for this extra work.

We can also see economies of scale as well as potential diseconomies of scale at work: As Business Objects’ product revenues have grown, its gross profit margins have reached 99 percent, rising from 92 percent in 1993. Gross margins on service and maintenance revenues, however, have been dropping slightly over time, from 72 to 61 percent over the same decade (Figure 4). The disparity between products and services (including maintenance) is more striking when we look at how much lower service margins are at some companies – in 2002, 30 percent at Compuware, 36 percent at Adobe, 39 at Oracle, and 45 percent at Siebel.

Figure 4 about here

In short, it is clear that, for software companies, products are generally *much* more profitable than services, and easier to grow without adding headcount. This is why software companies should want to sell standardized products that generate license fees without the baggage of too much customization services and unique technical support and labor-intensive training or integration services. Software products companies in rapidly growing markets generally should try to minimize their service offerings even though service offerings are often necessary to make a sale to enterprise customers. Companies in the custom software or IT services business may also want to try to “product-ize” or package their offerings to increase profit margins and growth potential. Investors such as venture capitalists generally have a strong preference for software products companies

because they have much more potential for rapid growth and profits. On the other hand, in bad economic times, or as a software company's products become more commodity-like or "mature" (i.e., fewer new compelling features in each release), then the best option for a company is to grow service and maintenance revenues, broadly defined.

I should add that hybrid solutions companies often rely on outside firms to provide integration and customization services. Both SAP and Microsoft have grown their overseas sales by using third-party consultants and solutions providers. Hybrid firms that try to take over more of this services business themselves will create some conflicts with their "channel partners." This is part of the business, however, and software companies need to evaluate how valuable these partnerships are against the benefits of increasing in-house services revenues.

Ninety-Nine Percent of Zero is Zero!

Strategy for firms in software and other businesses begins with a decision on what markets to compete in and how to compete. But, once managers know what business they want to be in, they still need to decide whether to emphasize *products* or *services*, or *how to combine the two*. We have seen that the business models and potential profit margins can be very different: In software, products companies should try to be more like printing presses with best-seller books because they can have extremely low costs of sales. Software services and hybrid solutions companies should try to be more like banks with a large base of assets (an installed user base, combined with long-term service and maintenance contracts) from which they can derive a steady stream of revenues, even if these revenues are more labor-intensive and costly than selling packaged software products. Companies in other technology-based sectors generally have much higher expenses when replicating their products, and can earn higher margins as well as steady revenues from services.

Although the business models are different, and require different organizational capabilities, companies selling to other companies usually need to offer both products and services, especially to survive bad economic times but also to grow beyond the limits of their product sales. On the one hand, new products are the source of many service revenues and product upgrade fees. On the other hand, when new product sales or upgrades are slow, as occurred after the Internet bubble in 2001-2002, services and maintenance provide a base for much-needed revenues and profits, and can be the difference between success and failure as a company. Also, since products tend to become commodities over time, and markets can become saturated with similar products, until there is some major change in the technology, products companies usually find that sales growth slows after awhile.

In the software business, it may actually be a "law" that products companies inevitably become services companies or hybrid solution providers. Their strategy and management practices, and internal capabilities, must adapt to this transition. At the same time, *because selling products is different from selling services, even hybrid solutions companies need to have a primary strategic orientation of either services or products*. For most hybrid companies, the primary orientation will probably be products because that is usually the business model they began with and should always offer some advantages for scale economies and operating margins.

In other technology-driven businesses, like computer hardware, telecommunications equipment, semiconductors, and industrial equipment such as GE provides, we see similar patterns of growth in services relative to products, and we even see higher actual profit margins from these services businesses. The higher margins from services compared to products may be limited to companies selling hardware products, but even software companies need to reflect on what their total costs are, including R&D and marketing expenses, which are not figured into gross margins. In other words, companies in some businesses, like enterprise software, may indeed generate up to 99-percent gross margins on their product sales. But if their product sales collapse and fall to nothing, then another mathematical “law” comes into play: 99 percent of zero is zero! This fact is perhaps the most compelling reason why, to have a business model that lasts through good and bad times, many companies should try to sell a combination of products and services, not one or the other.

Table 1: Revenues and Margins Analysis for Selected Companies

<i>Company</i>	<i>2002 Revenues (\$ billion)</i>	<i>% Services</i>	<i>Services Gross Margins</i>	<i>Products Gross Margins</i>	<i>1995 Services Percentage</i>
IBM*	\$ 81.2	45%	26%	27%	18%
Hewlett-Packard	56.6	18	33	25	14
Cisco	18.9	18	70	62	--
EMC	5.4	22	42	38	2
General Electric	131.7	57	34	30	51

Note: For IBM, products refer to hardware products. Software products had a gross margin of 84%.

Source: Calculated from annual reports.

Table 2: Comparison of Software Company Income Statements, Fiscal 2002-2003*(Units: Percentage of total revenues, unless noted by \$)*

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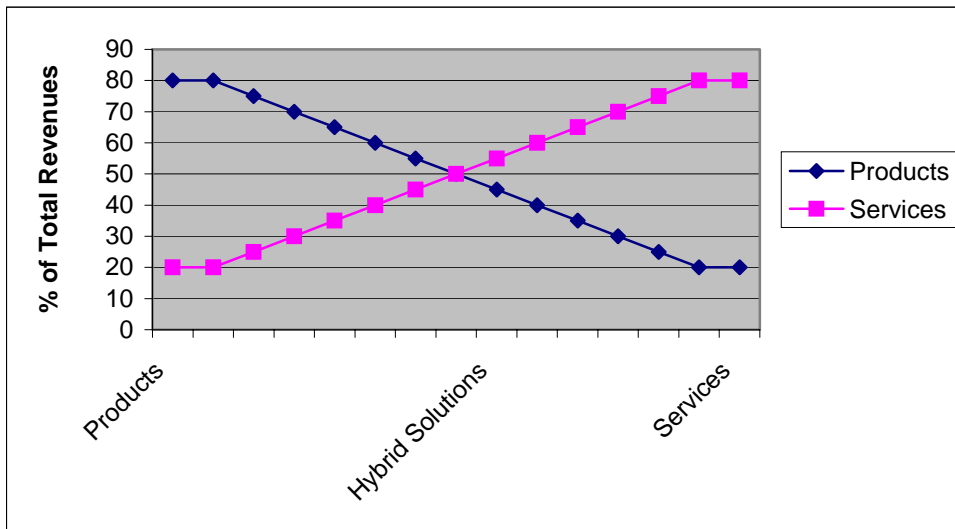
Key: Bobj (Business Objects), Orcl (Oracle), i2 (i2 Technologies), Msft (Microsoft), Cpwr (Compuware), Siebel (Siebel Systems), Psft (PeopleSoft), Adbe (Adobe)

Company and Fiscal Year	Bobj	i2	Msft	Orcl	SAP	Siebel	Psft	Cpwr	Adbe
	Dec.	Dec.	June	May	Dec.	Dec.	Dec.	March	Nov.
	2002	2002	2002	2003	2002	2002	2002	2003	2002
Revenues (\$ million)	\$455	\$908	\$25,296	\$9,475	\$6,880	\$1,635	\$1,949	\$1,729	\$1,165
Revenues Breakdown:									
% New License Fees	54	10	NA	35	31	43	27	24	99
% Services & Maintenance	46	90	NA	65	69	57	73	76	1
Gross Margins									
Software Licenses	99	97	NA	NA	NA	97	92	91	92
Services & Maintenance	61	65	NA	62	NA	45	53	30	36
Costs (as % of Revenues)									
Software Licenses	<1	<1	NA	NA	NA	1	2	2	8
Services & Maintenance	15	32	NA	25	NA	31	34	53	1
Sales and Marketing	49	22	19	22	24	37	26	23	33
Research & Development	17	19	15	12	12	13	17	6	21
General & Administrative	6	7	5	4	5	11	6	4	9
<i>Operating Profit Rate</i>	<i>11</i>	<i>(-)</i>	<i>42</i>	<i>36</i>	<i>23</i>	<i>(-)</i>	<i>13</i>	<i>(-)</i>	<i>25</i>
Average Employees	2,196	3,880	49,050	41,328	28,604	6,800	7,800	11,692	3,000
Sales/Employee (\$1,000)	\$207	\$234	\$578	\$229	\$240	\$240	\$250	\$149	\$390

Source: Calculated from company reports and press releases. 2002 employee and sales/employee data are estimates for i2, Siebel, PeopleSoft, and Adobe. Reprinted from M. Cusumano, The Business of Software.

Notes: Gross margins calculated as % of respective license and services/maintenance revenues. 2002 sales and marketing, R&D, and G&A percentages for SAP are for 2001 fiscal year. SAP revenues are based on January euro exchange rate (.93 = \$1.00). Service revenues include contract software for i2.

Figure 1: Three Business Models



Source: Michael A. Cusumano, The Business of Software.

Figure 2: Services and Maintenance as Percent of Total Revenues (2002)

Source: Michael A. Cusumano, The Business of Software.

Notes: IBM numbers reflect services revenues as a percentage of combined services and software revenues. i2 numbers include contract revenues on the restated basis.

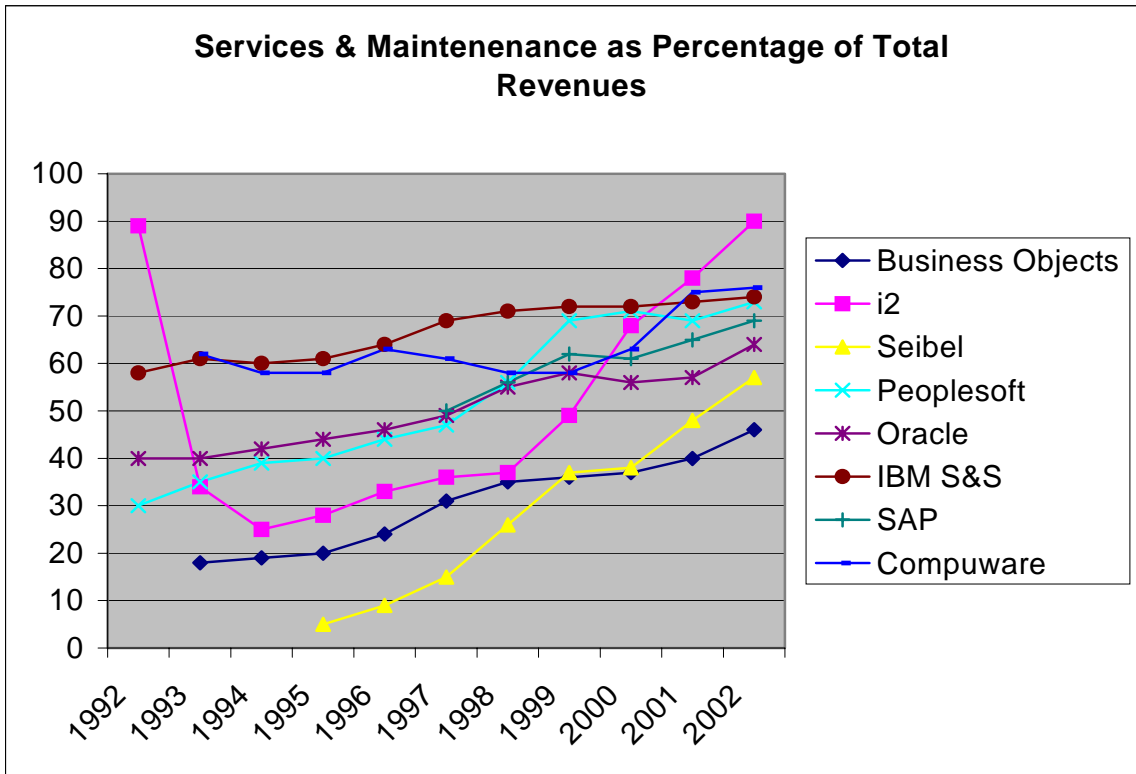
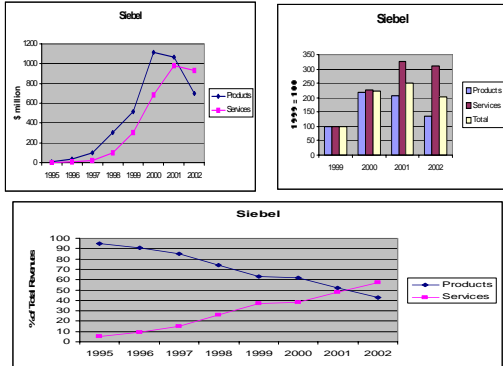
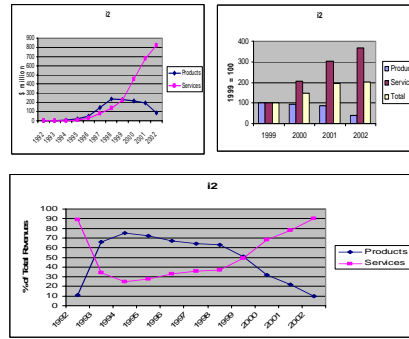


Figure 3 Products vs. Services and Maintenance Revenue Analysis

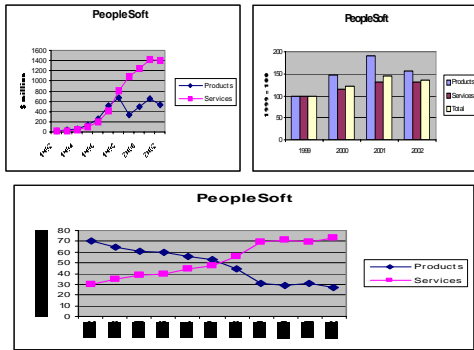
Source: Michael A. Cusumano, The Business of Software.



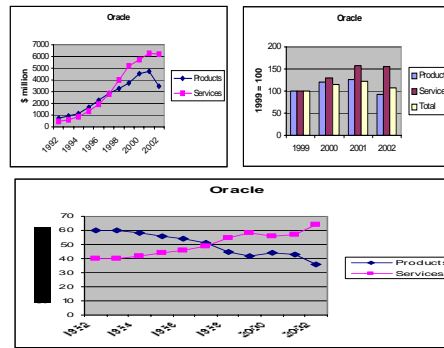
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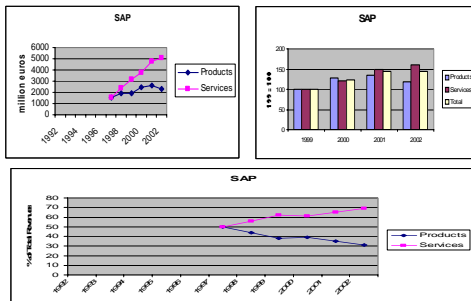
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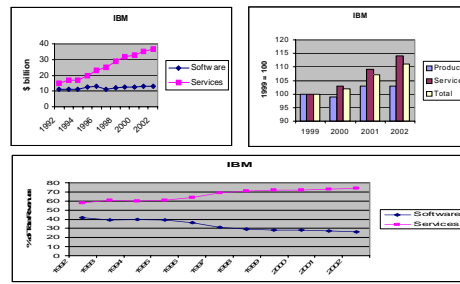
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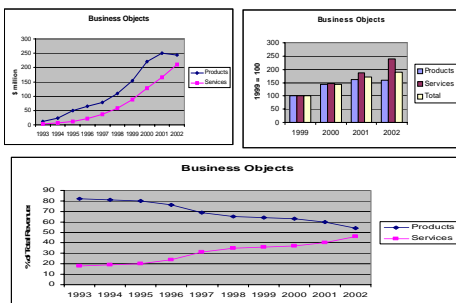
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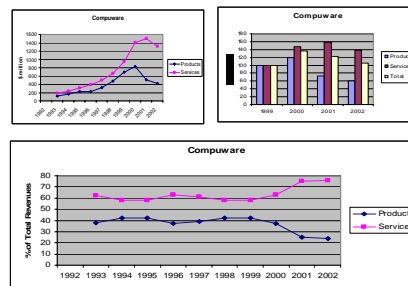
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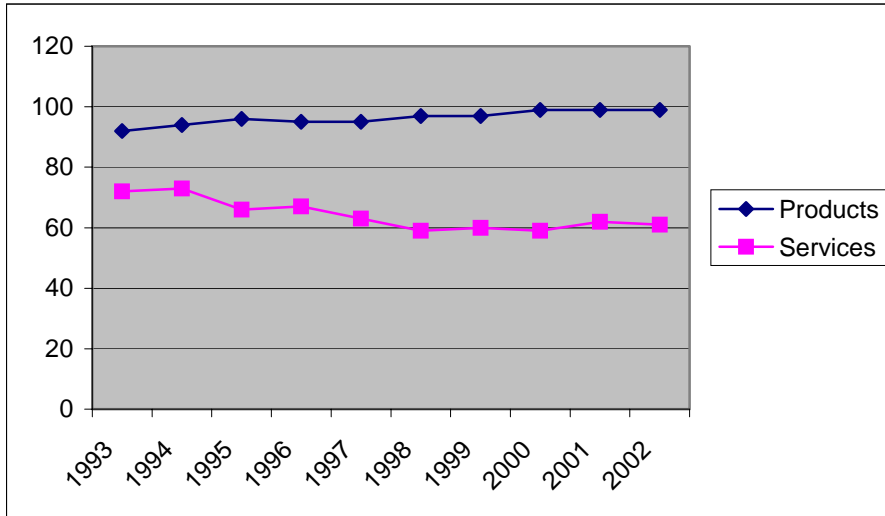


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Figure 4: Business Objects' Gross Profit Margins, 1993-2002



Source: Company Form 10-K reports, annual. Reprinted from Michael A. Cusumano, The Business of Software.

Endnotes

¹ The parts of this article discussing software companies are based on sections of Chapter 2 from a new book, Michael A. Cusumano, The Business of Software: What Every Manager, Programmer, and Entrepreneur Must Know to Thrive and Survive in Good Times and Bad (New York: Free Press/Simon & Schuster, 2004).

² For a good discussion of the services versus products debate in software and other industries, see Satish Nambisan, "Why Service Businesses are not Product Businesses," MIT Sloan Management Review, Summer 2001, vol. 42, no. 4, pp. 72-80.

³ See, for example, Joseph Pine, Mass Customization: The New Frontier In Business Competition (Boston, Harvard Business School Press, 1992).

⁴ See Hewlett Packard Company, Form 10-K, Fiscal Year Ended October 31, 2002, p. 8.

⁵ See Cisco Systems, 2003 Annual Report, p. 26.

⁶ See the EMC web site www.emc.com/global_services/overview/index.jsp (accessed October 22, 2003).

⁷ General Electric Corporation, Form 10-K, Fiscal Year Ended December 31, 2002, pp. 3, 72.

⁸ Dell Computer Corporation, Form 10-K, Fiscal Year Ended January 31, 2003, pp. 3-4.

⁹ See the Intel web site http://www.intel.com/products/services/index.htm?iid=HPAGE+header_products_services& (accessed October 22, 2003).

¹⁰ See the discussion in Cusumano, Chapter 2.

¹¹ This breakdown is also supported by the McKinsey study of software companies. See Detlev J. Hoch et al., Secrets of Software Success (Boston: Harvard Business School Press, 1999), p. 36, note 14.

¹² There are some interesting similarities and differences between my three business models and the "delta" framework of system lock-in, total customer solutions, and best product. See Arnaldo C. Hax and Dean L. Wilde, The Delta Project: Discovering New Sources of Profitability in a Networked Economy (New York: Palgrave, 2001).

¹³ For a more detailed discussion of platforms, see Annabelle Gawer and Michael A. Cusumano, Platform Leadership: How Intel, Microsoft, and Cisco Drive Industry Innovation (Boston: Harvard Business School Press, 2002).

¹⁴ See the SAP annual reports and financial data for 2002 at www.sap.com.

¹⁵ Microsoft Corporation, 2001 Annual Report, p. 26.