

## **VALUING COMPUTER SOFTWARE AND SOFTWARE COMPANIES**

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### **PART I – INTRODUCTION TO SOFTWARE, SOFTWARE IS EVERYWHERE**

To begin with the crassest possible announcement: There's gold in them thare chips - microprocessor chips, that is, and one can make a darn good living not only by creating high tech companies, but also by valuing them. In both instances, you've got to know what you are doing and take into account the characteristics and possibilities of the product. It is a vast field, encompassing many different disciplines and philosophies.

We would find it very difficult to live nowadays without all the sweeping electronic developments that have taken place in the last twenty year; we seem to be tied to them, "for better or worse", a phrase that may ring a bell with many of us in a different context.

There's much in software that's good, but sometimes it seems to this closet Luddite there is just about as much that's bad. Software enables airlines to crowd us in like sardines, call it "yield management" and present it as something for everyone's benefit; it gives us mobile telephones, which makes it impossible to hide anywhere - be it from agitated clients or bill collectors, and it clears checks within 24 hours; in the good old days, that process used to take two, sometimes three weeks. Long gone is the time when credit card charges from Europe or Asia needed at least six weeks to show up on your statement.

But software is also a key factor in many "medical miracles". We all know someone with a pacemaker, have read or heard about chip-controlled artificial limbs or something equally astounding, which today is practically taken for granted.

On a lesser scale, software turns off the coffee maker when the brew is just right; we get instant replays during a sports event; supermarket shelves are kept stacked with goods we want to buy. Companies or individuals can share documents and ideas around the globe, we can watch Marlene Dietrich in a tailor-made commercial, years after she died, and there are video games for pigs to play; developed at the University of Guelph in Ontario, they cause them to gain weight faster. It's a revolution alright, and we are forced to get used to it as rapidly as our little grey cells can manage.

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## Background

Actually, this will be the third major revolution since 1776, when Massachusetts and a few likeminded colonies declared their independence from Britain. It started with the "Steam Age", which lasted well over a hundred years; the first passenger steam railroad started service in Northern England during 1825, followed in 1826 by the first US line out of Baltimore.

Steam also made manufacture independent of water power; it allowed plants to be built away from the rivers, which, till the middle of the 19th century, had been the only economically feasible way to transport goods. The English economy soared, driven by a new technology rather than the discovery of mines, as in South Africa, or by a new crop, as in the West Indies.

The new invention culminated in superb national railroad systems. Aided in 1835 by Samuel Morse's invention of the telegraph, between 1850 and 1860, railroad tracks in the US increased from 9,000 to 30,000 miles, and the Midwest was connected with the East coast. For the next fifty years, the railroads dominated the economy: freight ton miles rose 9,700% and employment expanded by 2,300%. That is not all that different from the explosive growth of the Internet, with more yet to come.

The second, the "Machine Age", brought us two dominant innovations, the automobile and electricity. This led to the rail links being rapidly supplemented by the world's most extensive highway net, giving us a distribution system for goods, especially food, which in my view has no equal anywhere in the world.

The third is the "Digital Age" of Software and the Internet.

All this means that mankind has had to change and adjust its thin-king on a number of previous occasions. We made it then, and we will likely make it now. There is one vast difference: the two previous revolutions did not have to contend with a rapacious government, the IRS, aggressive regulatory authorities and far-flung, well-informed shareholders.

We do! That's where the savvy valuator comes in, and that is what I will be talking about today. Doing your best for your client can definitely work out in your favour, if, as I said before, you take everything into account that could have a bearing on the value of the product.

## Factors of Production

The three traditional factors of production are Capital, Labor and Land (resources); the "Digital Age" has added "Information" to those three pillars. According to Business Week, August 31, 1998:

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The information revolution will continue to boost productivity across the economy. Over the next ten years, such information-dependent industries as finance, media, and wholesale and retail trade are expected to change the most.

Increasing globalization will simultaneously provide much larger markets and tough foreign competitors. The result: companies must become even more innovative while cutting costs.

In my opinion the human brain is still unmatched by anything called "ARTIFICIAL INTELLIGENCE", but processing large amounts of information can only be done by computers. As no computer functions with-out software, this means an increasing demand for the product.

Although no longer as prevalent as a few years ago, some garden-shed wunderkind could be turning out new and exciting stuff, which he believes to be worth a cool million or more to be shelled out by eager investors. In reality, his discovery may be worth a tenth of that, or even nothing at all; it may already exist, if not on this continent, maybe somewhere else. And if it doesn't, perhaps it is because nobody wants it.

I always mention a well-regarded real estate company that assured us their software had no competitors - none. We stopped our re-search after we had found 43 - not in their country, but in Europe and Asia; as a result, their vast investment turned into a total write-off, and that has happened on several occasions, not just once.

To make the point again, I would like to amend the phrase "caveat emptor" into "caveat valuator"; in other words, do your homework. In preparing this presentation, I have relied not only on my experience of a dozen years of valuing software, but also on many published and some unpublished sources and studies. An important source is "The Software Industry Annual Report" from Deloitte & Touche LLP, a firm of which I am an alumnus.

### **What Is Computer Software?**

The question brands you as neither uneducated nor irrational. Aside from ever increasing demand for speed supplied by constantly improved software, without such software, a computer is totally ignorant. The comment by Lady Ada Lovelace, Lord Byron's daughter, who financed Charles Babbage's mechanical predecessor of the computer, still applies:

"The Analytical Engine has no pretensions whatever to originate anything. It can only do whatever we know how to order it to perform."

That was written in 1843, one hundred and two years before ENIAC, the first successful electronic computer, which, together with elementary software, took up the whole gymnasium of the University of Pennsylvania.

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According to Webster's Dictionary, software is:

"Both the precise sequence of instructions that enable a computer to undertake a particular activity and the writ-ten code, flow charts, sub-routines, objects, languages, procedures, documentation, data, etc. that are used to prepare it".

Some of you may remember when spreadsheets and Financial Projections were done by hand; using a slide rule was considered progressive. Now, the Pentium on my desk which takes care of all that and then some, has more power than the whole mainframe at the Wall Street investment bank where I used to work some 38 years ago.

To put it simply, software instructs a computer what to do, how to do it, and how fast. Computers are expected to become even faster and cheaper in the future as they continue to adhere to "Moore's Law". In 1965, Gordon Moore, Co-founder of Intel, stated that,

"The cost of computing power drops roughly 30% every year, and microprocessors double in power and speed every eighteen months."

By about 2004, this Law is forecast to come up against the Laws of Physics, but so far, I'm backing Moore.

### **Types of Software**

The IRS has its own views, perhaps interpreting Webster to suit its philosophy; Rev.Proc.69-21 defines computer software as:

All programs or routines used to cause a computer to per-form a desired task or set of tasks, and the documentation required to describe and maintain those programs. Computer programs of all classes, for example, operating systems, monitors, compilers, and translator assembly routines, and utility programs, as well as application programs are included. "Computer software" does not include procedures which are external computer operations, such as instructions to transcription operators and external control procedures.

There are two types of software, Systems and Application.

Systems Software allows a computer to function. It includes operating systems like Windows or UNIX, as well as service and utility functions that handle activities such as: managing sorting, merging & converting data, system accounting, diagnostics, performance measurement, report generation and security control.

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It is highly unlikely that you will ever have to value a Systems Software program on its own, as there are only about 70 varieties in general use; normally, except for depreciation purposes, it is grouped with the related hardware. Therefore, we will not discuss it further.

Application Software supplies instructions for computers to carry out specific functions related to the management, storage and processing of data. In our profession, we all use it, for accounting, spread sheets and word processing.

This presentation deals with some of the approaches and problems of valuing Application Software and the organizations that create it.

### PART II - APPLICATION SOFTWARE

#### Categories of Application Software

There are five main categories of Application Software; they are based on different technologies and serve distinct markets.

- Enterprise: Products that control business processes and activities; they may serve a single vertical market (such as financial organizations), or supply a function (like accounting) to many industries.
- Packaged: Programs that run on personal computers or servers; normally used to improve individual productivity, such as word processors, spread sheets and personal information managers.
- Technical: Systems that assist the design and production of items ranging from mechanical devices to food, computer chips and even other software.
- Edutainment: Programs, usually running on PCs, that offer entertainment or education, mainly oriented to the under-twenty crowd. The software for the video game created to encourage pigs to eat more and gain weight faster certainly falls into this category.
- Internet/E-Commerce: Software used for accessing the Internet, transmitting information between participants and entering into business transactions. This category is almost totally integrated with services, be they from a Telco, an ISP (Internet Service Provider), a Computer Reservations System or a bank ATM (Automated Teller Machine).

#### Application Software is Different from Everything Else

Today, society is dependent on computers in nearly every country. It is unthinkable to function without software, which is effectively a capital item, but often expensed on purchase.

- The market life of software is limited; generally, investors and tax authorities will accept two years. However, established programs are often enhanced to prolong their life-span with several "new" versions. Those obviously improve its value by increasing and

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extending the cash flow. In some cases, subsequent versions are almost a different product and may require an additional valuation.

- Software is the ultimate intellectual property: once it has been created, making and selling an infinite number of copies is easy and cheap, other than marketing expenses; therefore, it has a cost structure completely different from most goods and services.
- Barriers to entry are normally at the marketing, not the code creation level. Logically, one first must find out if anyone really wants the product, and what advantage it may have for any group or sector.
- In most industries there are standards: the world agrees on the layout of car pedals; North America accepts one electric plug and line voltage; Europe, where there has been much more dissension than in the US, managed to do the same - albeit different from ours. Of course, that excludes Great Britain, which uses plugs three times the size of ours... Standards have also been negotiated for software, but with change happening so rapidly, most are determined by the market, followed by the regulators.
- Past losses and the level of shareholders' equity have little impact on the value of a software company, which depends on future prospects.
- The major capital expenditure is on R&D, which is written off as incurred. In valuations, such amounts are capitalized to the extent that an asset has been created.
- Significant contributors to the value of a software company, such as "distribution channels" and "installed base of users", erroneously are frequently ignored by accountants and therefore do not normally appear in the financial records.

### Typical Software Economics

Most industries show declining economies of scale: the bigger an organization or plant gets, the more layers of management and infrastructure are needed, at least, are created - or should I say, metastasize? With software, the opposite is true. Once development is completed, the only large ongoing expenses are for advertising and marketing; manufacturing and distribution costs tend to be fixed and rather low. Therefore, the product has increasing economies of scale, which is demonstrated by the following example based on PC packaged products from real companies:

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	<b>Company M</b>	<b>Company C</b>
Product R & D	\$250 million	\$200 million
Software Selling Price/Unit	\$350.00	\$350.00
Variable Costs/Unit	\$50.00	\$50.00
Share of Market	80%	10%
Units Sold	8 million	1 million
Revenue	\$2.8 billion	\$350 million
Gross Profit	\$2.4 billion	\$300 million
S G & A (40%)	\$1.1 billion	\$140 million
Operating Contribution	\$1.3 billion	\$160 million
Return on R&D	520%	64%

This shows that whoever is first out of the gate, retains the lead; temporary monopolies are quite normal, although I know of none in the software field as long-lasting as that of Bill Gates.

If you have seen the Charlie Chaplin classic "Modern Times", you will remember that at some point, the machines simply run away from him and he can no longer cope. A similar situation from the old Lucille Ball show is now being used in a commercial, with Lucy and Ethel stuffing candy on a conveyer belt that seems to get faster and faster. All I want to say by this is that with software, speed is everything. Unless it's happening now, and unless you can reliably value it NOW, everything is bound to change, from any edge over the competition to investors' enthusiasm.

### PART III - SOFTWARE COMPANIES

#### Accounting For (Software) Twinkies

"A dollar spent on a toaster doesn't reduce your wealth in the same way as one spent on a Twinkie. One lasts, the other doesn't. But where do toasters end and Twinkies begin in the information economy?"

That question was posed, in 1998, by Peter Huber, a writer for Forbes; I don't believe he is a CPA, but he thought out a highly applicable philosophy for recording software in Financial Statements, which, after all, is a CPA's job.

He writes that according to tax collectors and securities' regulators, land values last forever, brick and metal for ten or thirty years, and silicon chips for five. Windows are all pure Twinkie.

Then he reasons that possibly, Washington may have it backwards: only half the cost of Windows is to improve current productivity, while the other half forms the base for a subsequent version. A software's useful life depends to a great extent on your ability to hang on to your trained employees,

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which likely give you increased productivity year after year. If your accounts reflected this, your P&L statement would be different.

Huber goes on to say that when a company runs out of disk space or processing power, it keeps its old software and files and chucks the computer. With the Internet, a credit card company no longer needs offices in expensive Manhattan, but can locate anywhere cheap, even offshore. The Twinkie is eating the toaster.

Accountants don't know what to do about this, and neither do regulators, as none can be certain whether or not anything has a real future value until the future is here.

In customary fashion, tax collectors go the other way to maximize revenue; the IRS would like us to capitalize everything, from airline engine maintenance to advertising.

Does this by any chance mean that Washington is losing its grip on economic reality?

### Value Drivers

In most businesses, selling prices are dictated by the market: a better product or a stronger brand gets a higher price; margins are improved by keeping costs down. Software is different: the price depends on what it can do for the customer; margins depend on functionality not costs. A critical part of the valuation process is to determine if the firm or its product has a special edge that enables it to charge a premium price for a product in high demand.

Some of the other factors to be taken into consideration:

#### *Positive Aspects*

- Markets - size & growth
- Technology - state of development
- Products - one or many
- Customer Base
- Positioning/Brand Names
- Delivery Mechanism
- Management/Staff
- R&D Team
- Development Program

#### *Some of the Positive Aspects can also be Risks*

- Competition
- Management
- Size

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- Capitalization
- Product Range
- Dependence
- Location
- Ease of Entry
- Margins and their Variability
- Regulatory Situation

Two other factors are important: interest rates, and the enthusiasm of investors for the industry. At present, it is difficult to raise funds for mineral exploration, no matter how promising, mainly due to low worldwide demand for metals. On the other hand, a software producer in Ottawa raised funds at 170 times historic revenues, although I considered that at best it was worth eight times. Five years later, the firm was taken over for its tax losses. The moral is that you should never ignore the image factor, and the mood of investors at the time of the valuation.

### There Are No Rules of Thumb

In most industries, there are broad trends that are relatively easy for the valuator to grasp. Therefore, with numerous transactions, "Rules of Thumb" have become established. In the software industry, there are very few broad trends or long-term effects, and for that reason, no universally applicable rules. In some way or other, nearly every software situation is an exception.

The majority of software companies usually does not have a high value, according to the last six years' M&A statistics on "Computer Software, Supplies & Services", published by Mergerstat@:

	Transactions		P/E Offered		Value \$mill	Premium/Relative			Median Size
	#	%	(base)			(base)			\$mill
		A	B		C	D	E	F	
1993	173	6.5	43.5X	(3)	2,964	43.5%	(4)	1.12	na
1994	197	6.6	43.2X	(7)	13,275	59.1	(12)	1.41	10.5
1995	336	9.6	39.6X	(15)	25,962	43.3	(19)	0.97	8.6
1996	637	10.9	42.8X	(22)	20,287	39.1	(22)	1.07	10.5
1997	854	10.9	36.3X	(41)	22,085	37.1	(39)	1.04	7.4
1998	963	12.3	29.8X	(56)	52,678	55.2	(63)	1.36	9.2

#### Notes:

- A Software transactions as a percentage of all M&A transactions.  
 B Number of profitable companies forming base for P/E Offered.  
 C Premium over stock price for public companies.  
 D Number of public companies.

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- E Relative premium for software public companies over all public company transactions.
- F Value of median transaction.

The table shows that the proportion of all transactions related to computer software companies nearly doubled over the six years. In the period, their dollar value rose nearly eighteen times. It also demonstrates that the standard "metrics" of "Price/Earnings Ratio Offered" and "Premium Offered" have too small a base to be meaningful for valuing software companies.

Finally, the variances between the mean values (\$54.7 million in 1998) and the median values (\$9.2 million that year) indicate that as well as some very large transactions, there are numerous small ones; in many of those, an acquirer improved his situation by buying technology rather than building it.

### Products and Companies

With a few glaring exceptions, most software companies are small; therefore, in many cases: The Product is the Company.

This has advantages as well as disadvantages. Products can be very lucrative while they flourish, but they are generally short lived. That means that, unless the company constantly updates, enhances, even replaces the software, your client should not count on gains on the shares sufficient to put his children through college, or use them to set up trust funds for the grandchildren.

One hundred and fifty years ago, the great state of California was built on mining. When I am talking to politicians who don't understand technology - by no means a rare breed - I sometimes use mining companies as an analogy to software firms. Both start with an idea: mining with a prospect, the other with a software concept. Substantial amounts have to be spent on developing the potential ore body - the computer program - before any cash flow is generated. In many instances, there will be insufficient ore - or lack of interest in the software - to become commercially viable.

Once cash flow has started, much of it must be pumped back into further development; find more ore - enhance the software. Eventually, a mine runs out of ore, and a software concept, like DOS, has been passed by and ceases to generate cash flow.

For established entities, whether in mining or in software, the value of the company consists of the value of the products, plus its skilled staff, products (prospects) under development, the opportunity and intention to innovate, and its relationships with customers, distributors, suppliers etc.

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### Technology

#### *Product Lifecycle*

In assessing technology, the position of the product in its life cycle is fundamental; it may be driven by hardware capabilities or customer needs. In recent years, the economic lives of software have become shorter and shorter, but as many organizations are laggards, there are still firms that use long superseded products, so that the "tail" is becoming much longer.

#### *Networks*

In the 1990s, there was a trend to move information processing from mainframes to Client/Server systems; these require well designed networks, which grew in importance. At the same time, Microsoft's Windows NT grew much more rapidly than the traditional UNIX. Now Intranets within organizations and the Internet linking them are having a fundamental impact on the types of software purchased, and how it is applied.

### The Elegance of the Solution

The degree of elegance of the solution is important, as is the suitability of the architecture selected, as both have great influence on how easy it is to modify and enhance the Source Code. This is affected by the choice of Operating System and programming language, and the suitability of the architecture.

The hardware, operating system and programming languages chosen for a software program are also major determinants of the markets it can serve. Also to be considered are the quality of the Source Code, particularly the amount and comprehensibility of the comments that explain the reasons for decisions, and particularly the completeness of the documentation.

A crucial component is the programming team, the number of people, the languages they know, their experience and adaptability, as well as their ability to communicate internally. It is essential that the various elements of the programs easily fit together and are properly tested, with all bugs being recorded and corrected.

## PART IV - THE MARKET

### Market Dynamics

- Size: Value increases with size due to increasing returns, while, except for advertising, costs remain fairly constant;
- Growth: Value is enhanced by a rapidly growing market;
- Usage: The more people use or might use a software product, the more valuable it is.

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In valuing a software company, it is of considerable importance to determine where its products are in the market cycle. As developed by Geoffrey Moore in his book, "Crossing the Chasm", the market cycle is based on the type of users rather than the period during which the product has been available. The categories are:

- Innovators
- Visionaries (early adopters)
- The CHASM
- Pragmatists
- The Second Gap
- Conservatives
- Laggards

The CHASM is the boundary between success and becoming a living dead; some companies or technologies are never able to cross it, but once a product is starting to be bought by the Pragmatists, its value jumps substantially. Basic differences are set out below.

### **Visionaries**

Intuitive  
Support revolution  
Contrarian  
Break away from the pack  
Follow their own dictates  
Take risks  
Motivated by future opportunities  
Seek what is possible

### **Pragmatists**

Analytic  
Support evolution  
Conformist  
Stay with the herd  
Consult with their colleagues  
Manage risks  
Motivated by present problems  
Pursue what is probable

The delivery mechanisms required to satisfy Pragmatists are very different from those needed for Visionaries.

### **Size and Growth of the Market and Competition**

The potential size and possible growth of the market must be taken into consideration when valuing software. Rapidly changing technologies may permit a competitive product to take advantage of the existing program and add better features, something that may not be possible for the original; this will reduce its value.

The demonstrated size of the market for the competitive product and penetration by a specific technology are a guide to the probable market share of the product being valued.

Rates of growth vary widely, depending on the maturity of the technology and the market. A new solution presented to a stagnant market can totally change growth rates.

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On the other hand, if there is no competition, there may be no market, and yet, enormous mass markets have been created for products nobody knew they wanted, such as hi-fi's, condos, cruises or health food stores. In 1950, Thomas J. Watson Jr., Executive VP of IBM, approved creating their first general purpose scientific computer, believing they "could find customers for as many as 30 machines".

Today, almost every piece of software is:

- Replacing an existing solution;
- Competing head to head with alternatives;
- Threatened by a novel approach.

All three situations may occur simultaneously.

### Positioning

In valuing a software company, it is essential to understand the place each of its products occupies within two interrelated systems; first, the customers' alternative choices for a purchase; second, and more important, as it determines the first, are the various companies interacting to make the "market".

The next section is based on "Crossing the Chasm" and "Inside the Tornado" by Geoffrey Moore, the best works I know on "Hi-Tech" marketing.

### The Software Marketplace

<b>New Market</b>	Imperialists v Natives	Explorers & Forty-niners
<b>Established Market</b>	Old Guard: <ul style="list-style-type: none"><li>• Gorillas</li><li>• Chimpanzees</li><li>• Monkeys</li></ul>	Barbarians v Citizens
	<b>Established Product</b>	<b>New Product</b>

Understanding this situation is important to a valuation, as a firm's future and the prospects for each product are influenced by management's perception. A firm that does not recognize itself as one of the industry's archetypes is likely to be considered just another 'no name' company, easily ignored by the market and not expected to be around for long. This can become a self-fulfilling

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prophecy, since survival requires a certain amount of industry support. Each role implies different power relationships, alliances, and competitors.

### *Industry Archetypes*

- The \$500 Billion Gorilla: The only question is whether he is a benevolent or a cruel dictator.
- Chimpanzees: A threat to the Gorilla and a target for Monkeys, Chimpanzees must secure their power bases by retrenching into niche markets, building up sufficient product advantage to ward off attacks, and telling everyone that while they are not interested in expansion, they are prepared to defend their turf to the death.
- Monkeys: Their goal is to be the low-cost supplier and the easiest to do business with.
- Imperialists: Members of the Old Guard who have extended established products into new markets, either geographically by deeper penetration, or through adoption of a new platform.
- Natives: The mirror image of the Imperialists; instead of new technology, they have access to the customer through superb distribution and communications channels.
- The Explorers: Oriented to new products and new markets, they are disquieting because they do not seek immediate profits and are in for the long haul.
- Forty-Niners: Farthest removed from other companies, they claim to have found gold and are recruiting partners to cross the CHASM and mine it.
- Barbarians: They attack a contested piece of the market with pincer movements, the way UNIX gradually wrapped it-self around mainframes.
- Citizens: Related to the Old Guard, they fight a war of attrition and counterattack with new technology to pre-serve their position.

### **Software Markets are Maturing**

In all segments of the software market, other than packaged, the structure is slowly becoming one of up to a half dozen leading vendors accompanied by scores of smaller firms typically providing highly specialized products, many of which are integrated, or used in conjunction with systems from the major suppliers. The exception, packaged software, is dominated by Microsoft's "Office" suite, which has more than 75% market share.

Overall the traditional software markets are growing more slowly (about 15% a year) than in the past, with the notable exception of Internet/E-Commerce and the impact of online gaming and location-based entertainment on the Edutainment products. In addition to the obvious impact of the decline in the Asian economies on every-body but Microsoft, sales are being influenced by the increasing importance of replacement/upgrade business (leading to maintained market shares) and the rise of "good enough, cheap enough" solutions, which are attracting cost conscious new buyers.

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The major software producers have a history of acquiring small companies to improve or expand their technology base with complementary products or to extend their markets. This consolidation trend is likely to continue, with purchases being made not only by the majors, as a company must achieve a critical mass if it is to remain independent. All purchasers seek to extend their market, integrate related product lines, expand distribution, increase their customer base and most of all, add to market share.

Numerous products have relatively high shares of small markets in which in effect they created a strong "brand presence". Most of those have revenues of less than \$50 million and address specific functions or applications. Such companies are acquisition candidates, especially as "small cap" software companies, except those involved in the Internet, are no longer being given high multiples by the stock markets.

In 1997, worldwide IT companies undertook 4,040 M&A transactions for a consideration of \$243 billion; North American M&A increased 31% to 2,577 (64%), valued at \$159 billion (65%). Software companies represented 1,287 transactions (32%) for \$31.5 billion (13%); these figures were up 30% and 36% respectively from 1996. Activity in 1997 and even more so in 1998, was accelerated by the slowdown of IPOs. More privately owned companies turned to M&A to avoid the uncertainty of the IPO market.

### **Services - The Value Added Function**

Outsourcing of a firm's information technology operations is surging, as organizations farm out the operations of their data centers and bring in outside help to assist IT operations. This action, together with systems integrating, contract programming, and consulting, form the elements needed to establish a leading edge data processing infrastructure. In this approach, hardware and software are interchangeable, upgradeable components, while services "make it happen".

This trend has been accelerated in recent years by five key factors:

- Shortage of technically skilled personnel.
- The challenge of reprogramming for the Year 2000 and the introduction of the Euro.
- Increasing rate of technology change leading to useful lives of two years or less for some software.
- The requirements of implementing ERP systems.
- Avoiding finger-pointing by one stop shopping with "prime contractor" responsibility.

As business operations grew more dependent on IT, the services have advanced to become more integrated with the installation and operation of hardware and software. Consulting has moved from strategic IT planning to process re-engineering. Infrastructure building has moved from systems integration to COES implementations. Management needs to handle not only data center operations, but also "help desks", desktop PC administration, and network supervision.

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Most computer hardware and software companies have realized that it is essential to be able to offer services as customers are increasingly seeking "end-to-end vendor solutions". IBM established its global services group which has been extremely successful in obtaining outsourcing contracts and in supplying services in support of IBM's hardware and software businesses. Compaq acquired Digital partly to obtain its services capability, which is expected to result in faster adoption of Compaq's hardware in major corporations.

### **PART V SOFTWARE TRENDS**

#### **Underlying Factors**

The future growth of the software industry will continue to be driven by two fundamental laws. The first is Moore's law, which has been previously discussed; it has resulted in the doubling of microprocessor power every eighteen months for the same price.

The second, and probably in the long run more important, is Metcalfe's law, which states that the value of a network varies with the square of the number of users; No previous technology has resulted in values increasing at this kind of rate. Together these laws have been responsible for the exponential growth in value of Internet-based companies, and have resulted in some commentators loftily stating that "valuation standards are now nonsense".

Company purchases of software are typically made on a "one-off" basis; they install a particular capability, such as: word-processing, accounting, inventory control, etc. throughout the organization. When a project is complete and the system is in-stalled, there is often a lull, with emphasis on maintenance and enhancements of existing items until the next major employment.

This habit means that Enterprise and Technical software firms will tend to have a cyclical pattern in their sales, around a usually rapidly rising trend. Packaged software suppliers with much lower unit prices will show less cyclicalities. Edutainment developers have many similarities to movie studios in that all their profits are earned from a few hit products. Internet software producers serve a market that is growing rapidly but constantly looking for a "better mousetrap".

In addition to the software spending trends discussed in this part, three vertical markets are "coming out of the dark ages" in their demand for new software products. Global deregulation of the Tele-com industry, combined with new services, requires significant software investments to increase productivity, improve customer service and enhance competitiveness. The overriding worldwide trend in Healthcare is cost containment in the face of aging populations and rising medical expenses; automation is part of any solution. Combined with advances in medical technology, this leads to a rapidly growing demand for software. Retail, traditionally a low-tech

## **Valuing Computer Software and Software Companies**

industry, is increasing its need for software as it adopts Supply Chain Management, Customer Relationship Management and e-Commerce.

### **Y2K Problems**

Over the past few years, a lot has been said about the Year 2000, which is suspected to cause problems with many computer programs. Until the 1970's, with computer memory and storage very expensive, two digits were being used for the year instead of four, such as "76" for 1976. We had faith that the software would be replaced long before we had to face the year 2000 problem. This has not happened.

It's a litigator's dream; the Gartner Group, a US hi-tech research organization, estimates that worldwide, Y2K related law suits could ultimately reach US \$1 trillion in costs, more than their estimate for the funds needed to make the necessary adjustments.

As the world struggles to make sure its existing computer systems are Y2K ready, spending on new software started to dwindle in the second quarter of 1999, for three reasons:

- Lack of funds for purchasing new software as money has to be spent on fixing Y2K.
- Lack of manpower for implementation as personnel is needed to fix Y2K.
- Management freezes all new IT projects until early 2000 for fear of introducing new problems.

However, certain types of software are continuing to see good sales: e-Commerce/Internet applications, systems that extend traditional sales/supply chain operations, and programs which quickly increase productivity or are required to remain competitive.

Despite the impact of the Y2K issue on 1999 revenues, investors and valuation analysts should look at the long term trends driving investment in software firms. The remainder of this section deals with the trends for Enterprise software, the largest of the five segments of the industry.

In the short run, CVS believes that there is a strong likelihood that, after a wait-and-see period, new software purchases will accelerate, starting in the second or third quarter of next year. Improvements to systems have to be made and there will be a degree of certainty that the Y2K bugs have been dealt with for the next thousand years.

### **Enterprise Software**

CVS expects that over the next three years, there will be two major trends in Enterprise Software: first, the introduction of corporate portals to allow wider access to the information and knowledge held by the organization. Second is the expansion of ERP (Enterprise Resource Planning) systems to additional functions, such as Customer Relationship Management ("CRM"), Supply Chain Management ("SCM") and Data Warehousing/Business Intelligence ("BW/BI").

# Valuing Computer Software and Software Companies

## Corporate Portals

Most businesses generate far more data than can be taken advantage of as useful information by their employees. Some of this is organized and stored in a structured form of rows and columns, but much of it is unstructured, including documents, reports and e-Mail, all of which are not useful unless indexed so as to be easily retrievable.

The Internet has introduced nearly all computer users to a world of unstructured information. This is normally accessed through Portals which also included Search Engines, such as Yahoo!, which has 65 million registered users. Many corporations are adopting the Portals/Search Engine concept to supply all employees with a single "front end" through which they can access corporate information.

A Delphi Group survey of 300 business and IT managers at very large companies came up with the following reasons for installing a corporate Portal.

	%
Share information & work methods	22
Internal self-service "desk top"	21
Locate subject matter expertly	20
Reduce infoglut	19
Professional function-centered desktop	16
Other	<u>2</u>
	<u>100</u>

### *Corporate Portal Applications*

A wide range of applications are being deployed on corporate Portals. The table below sets out the results of a survey of 375 IT and business executives at "Information Week E-Business Expo 1999". There are three basic types of corporate Portals:

Information Portals are similar to those on the Internet in that they concentrate on unstructured data, using Search Engine techniques to find documents by key words. These capabilities are useful for employee communication and human resource services.

Data Portals are an extension of the traditional systems for accessing information stored in a DBMS (DataBase Management System). These capabilities are important for supporting customer, marketing and finance activities.

Collaboration Portals are means by which employees can work more efficiently in teams. They typically include: E-mail, threaded discussion groups, scheduling/calendaring and project management.

## Valuing Computer Software and Software Companies

<b>Application</b>	<b>Responses</b>	<b>Information</b>	<b>Data</b>	<b>Collaborative</b>
Employee Communication	91%	M	L	H
Access to corporate databases	68	L	H	L
Product catalogue & pricing	38	M	H	L
Human resource services	55	H	M	L
Customer relationship management	47	L	H	M
Finance/accounting	41	M	H	L
Training	40	M	L	H
Operations or fulfilment	39	M	H	L
Sales forecasting & Management	39	L	H	M
Purchasing/procurement	35	L	H	M
Personalization	30	H	L	M
Inventory management	28	L	H	L
Video teleconferencing	20	L	L	H
Link to industry auction site	20	L	H	M

While nine of the applications will primarily use data Portals, the growth is likely to be in information and collaboration Portals, which serve a broader base of capabilities and users.

### ERP Systems

One of the great success stories of the last five years in the Software industry has been the growth of ERP systems. They promise one database, one application and common screens across an entire multinational organization. Achieving this is extremely difficult; putting all business processes into the same application means integrating everything from human resources, accounting and sales to manufacturing, distribution and purchasing.

The appeal of ERP systems is obvious. Once an order is entered, the transaction ripples through the company. Inventory lists and parts supplies are updated automatically; production schedules, employment records and financial statements reflect every change. Best of all, each employee has the information necessary to do his job efficiently. Sales people know what delivery dates they can promise and managers can see the effects of the day's activities almost immediately.

The origin of ERP goes back to the 1960s and 70s, based on the idea that computers would enable only the proper amount of materials to be purchased for orders on hand, with delivery when required, thus reducing inventory. Today all such systems offer:

Finance & Accounting	Material Management & Inventory Control
Sales & Distribution	Master Scheduling
Budgeting & Planning	Work Order Management
Human Resource & Personnel	Logistics & Warehouse Management
Capital Asset Management	Purchasing & Sourcing

## **Valuing Computer Software and Software Companies**

Today's ERP adds features: quality control, process operation management, regulatory reporting "available-to-promise", demand planning, supply network planning, production planning and detailed scheduling are being implemented, often using various optimization techniques.

Implementation of an ERP system may require the re-engineering of some of the company's business processes to take advantage of the software's capabilities. Every ERP system is fully integrated and will not deliver the expected benefits if particular units say "you didn't involve me" and insist on continuing to operate as they did in the past. Many senior managers rebel at the idea that how they carry on the business should be determined by the information system; extensive stroking is required during implementation.

### **Expanded Resource Planning**

CVS believes that most existing and potential customers for ERP systems will expand them to cover various related functions.

### **ERP**

The market for ERP systems at large corporations appears to be saturated, as many of them made their installations in the 1990s as part of a program of updating and replacing systems in advance of Y2K. However, there is a sizable opportunity to install off-the-shelf ERP systems in medium-sized organizations with less than \$1 billion in revenues. One area of major growth will be data input/ output systems from manufacturing through offices to mobile workers.

### **Customer Relationship Management**

An ERP system automates "back office" functions - accounting, human resources, production - throughout an organization. In most cases, it did not deal with sales and other customer-related functions. CRM systems are receiving increasing attention in efforts to reduce the cost of customer service and maximize the revenue potential.

### **Supply Chain Management**

An SCM system expands the "back office" automation to suppliers, distributors and other business partners. It is intended to optimize the manufacture of delivery of goods and services based on forecast customer demand. This market is growing an estimated 50% a year and by 2003 should be of the same size as that for ERP. In certain industries, an SCM system can give an attractive return to companies with sales down to \$100 million.

### **Data Warehouse/Business Intelligence**

ERP systems generate enormous amounts of structured data, far more than has been readily available. With this, and information from Legacy Systems, companies are now purchasing BI products to improve the efficiency and effectiveness of their operations.

## Valuing Computer Software and Software Companies

### PART VI OTHER FACTORS

#### Firm Lifecycle

A software firm typically goes through six stages before it reaches sufficient maturity to either go public or be sold. One of our cases today deals with increasing value at a later stage of a soft-ware company's "private life".

<b>Stage</b>	<b>Key Events</b>	<b>Required Return</b>	<b>Source of Funds</b>
Start-up	Business Plan	40% - 50%	Seed Capital Angel Investors
Early State I	Software Development	35% - 40%	Venture Capital First/Second Rounds
Early Stage II	Initial Sales	30% - 35%	VC Third Round
Expansion I	New Products/New Markets	25% - 30%	Bank Loans Mezzanine Debt
Expansion II	Increased Market Share	20% - 25%	Bank Loans Bridge Loans
Exit	IPO/Sale	15% - 20%	

The period from Start-Up to Exit can be relatively short, three years or so, and should result in an increase in value of over ten times. At the Start-Up stage, the Business Plan is the most important single factor. Unless it is easily understood and credible, and the management team complete and experienced, it will be difficult, if not impossible, to get financing other than from family and friends.

Other factors that enhance the ability to raise funds are:

- A large and growing market with few competitors.
- Proprietary technology.
- Significant "first mover benefits" and significant barrier entry by others.

#### Delivery Mechanism

This is the link between the company and the customers. It includes marketing, sales, distribution, and customer support. As I have said before, marketing is the key: very few things sell themselves. Unless the valuation analyst is satisfied that management understands the market and how to reach it, he can have little or no confidence in its future. Keep in mind that marketing is rarely taught in Engineering, Science or Math Faculties, which produce most software company managers.

## **Valuing Computer Software and Software Companies**

### *Selling*

There are many successful methods of selling software, from a dedicated direct-sales force to packages on the shelves of the local retailer. The length of the sales cycle determines the appropriate approach. PC packaged products, which have relatively low prices and can be sold in a few minutes, are normally handled through retailers. A sale of Enterprise software to a government agency can take as long as two years and requires dedicated, experienced sales "engineers".

### *Distribution*

The distribution method must be geared to the needs of the sector. While direct selling is effective and gives good margins, it is very expensive, as the staff must continue to be well paid. Channel marketing through Systems Integrators or VARs (Value Added Resellers) is less costly, but results in lower margins and re-quires totally different pricing, cost and management structures.

The Internet offers low-cost distribution, usually at reduced prices, and can be regarded as the software five-and-dime of the nineties. Sales by this method were roughly \$700 million in 1998, and are projected by Forrester Research to grow to \$3.1 billion in 2003.

### *Customer Support*

A key factor that is often overlooked; the quickest way for a software company to lose customers is to keep them "on hold" on telephone support lines.

## **Management**

### *Range of Talents*

A wide range of skills is of greater importance in a software company than in most businesses. When you value a software company, you must investigate the team that runs it; one-man shows simply don't fly. The team must include individuals with experience in computer science, sales, marketing and finance. It is very helpful if they have a wide range of seemingly unrelated qualities and backgrounds, as this gives them an edge over the programmed automaton. Make sure the bankers and lawyers are not the ones to make decisions. Beware of sharp dressers, "grunge is good"!

### *Track Records*

It is very difficult to analyze how much any success or failure is due to the individual and how much to the team and circumstances. Also, keep in mind that a failure, or even two, does not necessarily mean bad management; it may well be a benefit if it has been made part of the learning curve. Do they know how much capital is really needed to see the company through its product and sales cycles?

## Valuing Computer Software and Software Companies

### *Enthusiasm and Tenacity*

Check if they are strictly nine-to-fivers, or if they are willing to hang around when necessary. Are they really prepared to put in the hours, all night sometimes, and to accept the risks necessary to make a software company grow? A useful test is to see who is there on a Saturday or Sunday.

### *Realism*

Do they really know what they are doing? Is there some wishful thinking? Do the revenue projections look like a hockey stick? A \$5 million company can grow by more than 100% for a couple of years, but not a \$100 million business. Very few firms go from nothing to \$50 million in two years

### *Ownership*

How much of the company does management own? Some investor ownership and outside directors are essential to avoid complacency and ensure responsiveness to the market, but too small a position for management reduces their incentives.

## PART VII VALUING SOFTWARE

### **Approaches to Valuation**

As with more conventional businesses, three traditional approaches to valuation, cost, income and transaction, also apply to software. The original investment to create the product is usually high, as it often involves many blind alleys. On the other hand, the re-production cost is normally lower, as the methodology has been established.

The replacement cost of the software covers not only the recreation of the Source Code and Documentation, but also a factor for the "time-to-market", and the expense of re-establishing dealers and the customer base. As none of those costs are reflected on the Financial Statements, they have to be taken into account in determining the Net Worth/Goodwill Value.

Traditionally, the income approach obtains a Net Income Value by capitalizing after-tax profit. Most software companies do not make profits, as their "capital expenditures" on R&D are expensed as incurred. Therefore, income based values are reached by Capitalization of EBITDA, or, more commonly, EBITRAD (Earnings Before Interest, Taxes, R&D, Amortization and Depreciation).

Another frequently used approach is the Discounted Cash Flow (Adjusted Present) Value. This should be applied separately to each managerially relevant segment of the existing operation, so that each of them is valued separately. The tax-shield should be segregated and valued with a lower discount rate. Part of the DCF value is a figure for each identified potential opportunity.

## Valuing Computer Software and Software Companies

As software companies usually incur losses, Transaction Based Values are normally established based on multiples of revenues. In selecting multiples, care must be taken to choose suitable comparables and to identify expected trends in revenues and the possibility of substantial variations.

### Intangible Assets

A company's information systems, which are mainly represented by software, are one of its three most important intangible assets; the others are its brands and customer relationships, while the third is the trained workforce. For the accountant, the economic phenomena that qualify as intangible assets are set out in FASB Statement 72.

In summary, an intangible asset should be:

- Specifically identifiable, with a recognizable description.
- Subject to legal existence.
- Capable of legally transferable private ownership.
- Manifest with tangible evidence, such as Source Code.
- Created at an identifiable time or period, or as the result of an identifiable event or process.
- Subject to being destroyed or to a termination of existence at an identifiable time or period, or as the result of an identifiable event.

In other words, there should be a specific bundle of legal rights and other natural properties associated with the Software.

To have a quantifiable value, an intangible asset should:

- Generate some measurable economic benefit to its owner/user, which should be measurable in financial terms, such as net income, net operating income, net cash flow, etc.
- Be able to enhance the value of other assets with which it is associated.
- Software owned or used by a company can be divided into five classes:
  - Software developed for sale.
  - Software created for internal use.
  - Customized software purchased or licensed from others.
  - Information bases generated internally.
  - Purchased or licensed information bases.

### Software in Use

It would take a several hundred page book to describe all the types of application software one might find in a corporation. Using our categories, I have listed some of the software you are likely to find and will then discuss the approaches to valuation. Finally, we look at one type of Enterprise

## Valuing Computer Software and Software Companies

Software, namely ERP products that run on a wide variety of machines, from legacy mainframes to the latest desktop unit using a range of operating systems.

### *Enterprise*

- Accounting/Databases
- E-Mail
- EDI (Electronic Data Interface)
- Business Intelligence/Data Warehouse
- ERP/SCM (Supply Chain Management)
- CRM (Customer Relationship Management)
- Customer Care/Call Centre

### *Packaged*

- Word Processing
- Spreadsheet
- Presentation/Desktop Publishing
- Databases
- Text translation
- Engineering
- CAD (Computer Assisted Design)/CAM (Computer Assisted Manufacturing)
- GIS (Geographical Information System)
- Visualization
- EDA (Electronic Design Automation)
- MDA (Mechanical Design Automation)

### *Edutainment*

- Training
- Internet/E-Commerce
- Browsers
- Servers
- Intranet

## **The Cost Approach**

As with most tangible assets, the Cost Approach includes two common types. The first is "Reproduction Cost" that covers an exact re-plica of the asset. The second is "Replacement Cost" that recreates the functionality or utility of the asset, but which may have a different form or appearance. "Replacement Cost - new" typically establishes the maximum amount an investor would pay for an asset. However, specially developed software may be unique and less useful than

## Valuing Computer Software and Software Companies

a replacement reflecting up-to-date technology. Therefore, the value of the asset must reflect the decrease in value due to functional, technological and economic obsolescence.

Two primary methods are used to estimate the reproduction and Re-placement Costs of computer Software; they are: Adjusted Historical Costs and Software Engineering Models. The first method is based on what actually happened, adjusted for inflation and "time-to-market"; it gives the Reproduction Cost. In many cases, Replacement Cost is significantly lower; this is especially common for older software or programs which were developed or enhanced over an extended period. Software Engineering Models are the most common way of obtaining this figure.

To apply the Adjusted Historical Cost Method, all development or acquisition activity is identified and the costs quantified. Care must be taken to include every applicable item, such as:

- Wages, benefits and bonuses, including options.
- Supervision.
- Management contributions.
- All overheads, including facilities.
- Equipment & materials.
- Testing, including travel to Beta sites.
- Allowance for profit if Software is to be resold.
- Entrepreneurial incentive if Software for internal use.
- Time-to-market factor.
- Adjustment for inflation.

Software Engineering models were not created for valuation purposes, but are intended to assist developers in estimating the effort, time and human resources needed for a software project. There are three models in general use: Constructive Cost Model (COCOMO) from the Center for Software Engineering (CSE), University of Southern California; Software Lifecycle Model (SLIM) from Quantitative Software Management, Inc. (QSM); and Checkpoint from Software Productivity Research, Inc. (SPR).

### Remaining Life Analysis

Software developed for sale usually has a relatively short life; many well-known organizations introduce a new version of their major products every eighteen months or so. However, many businesses, when they replace their hardware, transfer the software to the new operating system and extend its life far beyond that of resale products.

The theory of remaining life analysis was developed at Iowa State University in the early 1900s. In the various applicable analytical methods, survivor curves are used to estimate the decay rate of

## Valuing Computer Software and Software Companies

a group of similar data points (such as computer programs) as time passes. The theory is very much like the mortality concept used by insurance companies to estimate human life spans.

In most cases, there is insufficient information to calculate Survivor Curves and Probable Life Curves for the lines of code in a computer program. Therefore, our approach is to assume a maximum life of eight years, as after that period, the costs of enhancement and maintenance are usually of the same order of magnitude as the benefits being generated.

In estimating the remaining economic life of software, the valuation analyst should consider at least the following:

- The date the program was created.
- The operating system for which it was designed.
- To what extent it has been ported to another operating system.
- The maintenance/enhancement practices.
- How well it satisfied the user's current needs.
- The quality of the documentation.
- The degree of comments in the Source Code.
- Does it comply with industry standards and regulatory requirements?
- Are its speed and efficiency suitable for current demands?
- Historical economic lives of similar software.

### Income Approaches

In an Income Approach, the value of an intangible asset is considered to be the present value of the projected future economic benefits contributable to its ownership over its expected remaining useful life. Those benefits may result from royalty or license in-come, higher operating revenues or cost savings.

Two methods are commonly used in the value of software: Discounted Cash Flow or relief from royalty. You will all be familiar with the Discounted Cash Flow method, so there is no need for me to discuss it any further. However, the DCF value of software includes the present value at a relatively low discount rate of the tax savings incurred from its purchase in addition to the present value of the benefits.

The relief-from-royalty method is based on an estimate of the cost savings that accrue to the owner of an intangible asset, who would otherwise have to pay royalties or license fees on revenues from its use. The royalty rate chosen is based on analyses of empirical, market derived royalty rates for comparable or guideline in-tangible assets. As a result, the method is a hybrid between the Income and Market Approaches.

## **Valuing Computer Software and Software Companies**

For computer software, revenues from its use are projected over the expected remaining economic life. A market derived royalty rate is then applied to give the estimated royalty savings. An after-tax amount is calculated for each year of the remaining economic life and discounted to a present value in a manner similar to the Discounted Cash Flow Method.

### **Market Approaches**

Market Approaches estimate the value of an intangible asset by reference to actual transactions involving comparable items. For three reasons, they are extremely difficult to apply in valuing "Software Created for Internal Use" or "Information Bases Generated Internally."

The first reason is that information about sales of this type of software is not readily available. Second, most such events form part of the acquisition of an entire business, and third, custom software is usually unlike other software for which transaction data might be obtained.

Two adaptations of the Market Approach are sometimes applied to computer software: the Market Transaction method, and the Market Replacement Cost method.

When arm's length market data is available for comparable software, the value is typically expressed in dollars per Line of Code or per Function Point, just like land values are indicated as per acre or per square foot. The unit value can then be applied to the number of Lines of Code or Function Points of the Software being valued. The figure is most useful as a reality check, as the necessary adjustments needed for the differences from the guideline Software are hard to determine.

The Market Replacement Cost Method assumes that, if a commercial off-the-shelf software package can be found that supplies most of the functionality of the Software, the costs to purchase or license this package gives an estimate of the Replacement Cost of the Software. However, as the Software could be licensed or sold to others, this method will usually understate the value of the Software.

In some cases, the valuation analyst may request proposals from independent developers for the creation of programs comparable to the Software. Such estimates may be based on originating a complete custom system or modifying an existing package. From an independent source, these objective arm's length estimates give a good indication of the Market Replacement Cost of the Software.

### **Valuation of an ERP System**

In valuing software in use, the Market Approach is not often applied; however the Cost and Income Approaches are useful.

## **Valuing Computer Software and Software Companies**

### *Cost*

Unfortunately, a large portion of the costs incurred in installing an ERP system is not easily identifiable; these include: license and maintenance payments to the software vendor; consultants used in the implementation; staff time and overhead required for the planning and process re-engineering and the loss of production during the tune-up phase.

While rules of thumb don't normally apply in the software field, experience has shown that the additional external expenditures for an ERP system amount to between three and four times the initial cost of the license; total expenses can be up to eight times that amount.

### *Income*

As with costs, establishing the income, or preferably the cash flow benefits of an ERP system is difficult. In most cases, its introduction results in things being done that otherwise would not have been done, leading to changes in the cost structure. To the extent that activity-based costing (ABC) is in place or management can identify specific savings, the income contribution of the ERP system can be ascertained. If this has not been done, we have found that looking at changes in cash flow margins for the year before, the present year, and budgets for the year after installation give a measure of the benefits.

Our approach is to establish the Discounted Cash Flow Value using a relatively short life of five years with no residual value. As virtually all the costs can be written off for tax purposes very rapidly, we prepare the Valuation on a pre-tax basis, applying a pre-tax WACC (Weighted Average Cost of Capital). We then adopt the lower of the values given by the two approaches.

## **Systems Can Have Negative Values**

### *FoxMeyer Drug Company*

In 1994 this firm decided to replace its legacy mainframe systems with a \$65 million ERP project. Within three years, the Company filed for bankruptcy and had to sell off a major unit. The real culprit in the story is not technology, but unrealistic "magic bullet" thinking about software and its benefits. Fervent belief in the magic power of computers is widespread and plays an important role in business failures.

In the middle of the ERP installation FoxMeyer had the misfortune to lose a customer that accounted for 15% of its sales, but the major problem was a series of risky bets. Parallel to installing the ERP system, the Company embarked on an \$18 million state-of-the art computerized warehouse; this had severe technical problems, resulting in \$15 million of inventory losses.

To regain lost sales, the Company signed a contract with a new customer at prices that assumed the projected \$40 million annual benefits from ERP would be realized immediately. To

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accommodate this customer, the deadline for the ERP installation was pushed forward by 90 days, which prevented the inclusion of some business processes.

The results were predictable. The ERP system started up on time and customer orders were filled; however, widespread data errors led to inaccurate sales histories, limiting the ability to fore-cast inventory requirements. Ultimately, the firm realized less than half the \$40 million projected savings.

### *Vistajet Inc.*

At Midnight on Friday September 12, 1997, a software glitch shut down this discount airline, leaving a trail of angry passengers, unpaid bills and laid-off employees.

There was good demand for Vistajet's flights, with about 3000 calls a day, but their reservations software, written in-house, caused numerous problems, such as half of the calls getting lost. Ironically, the airline, which had begun service on May 26 of the same year, was planning to install a proven airline reservations system when it had to cease operations.

## **PART VIII VALUING SOFTWARE COMPANIES**

### **Valuation Approaches**

The three traditional approaches are all also applicable to software companies, but each needs some modification. Those to the Cost Approach are discussed in Case Study "A" . Most software companies do not show any significant Net Income in their first few years of operations; therefore, we generally apply the First Chicago Method for a Net Income Value.

#### *First Chicago Method*

When a company is in an early stage of development and a valuation is mainly dependent on a Business Plan and Financial Projections, the "First Chicago Method" of determining the Net Income Value is often used. Popularised in the 1970s by the Equity Group of the First Chicago National Bank, this looks forward from three to five years, and establishes a future value by capitalising the projected net income at that time.

Usually, three different "Outcome Scenarios" are considered: "Success", "Survival" and "Failure". The Success Scenario is normally the Business Plan, with Survival based on modest growth. As these values are calculated at a date in the future, they must be adjusted to their "present value" at the Valuation Date.

## Valuing Computer Software and Software Companies

The discount rate used is normally the rate of return required by a venture capital investor. The three values are then weighted by the probability of each Scenario and added together. The required additional equity capital is subsequently deducted to give the Net Income Value.

### *Discounted Cash Flow Method*

The starting point, as for the First Chicago Method, is a Business Plan. The Financial Projections are nearly always optimistic and require rigorous trimming; therefore, we frequently apply the DCF approach to the First Chicago Scenarios. The Discount Rate is based on the return required by investors and therefore varies with the client for whom the valuation is being prepared. The terminal value is critical, as often few profits will be earned during the projected period. A multiple of EBITDA or sales is a good way to establish terminal value.

### **Venture Capital Approach**

Software companies often sell shares to venture capitalists or other third party investors. Such transactions can be useful support to a valuation, but it is essential to recognize that there may have been one or more significant value-creation events between the investment and the Valuation Date.

A further factor is that venture capitalists often purchase convertible preferred shares, which are not directly comparable with the common shares due to retraction or redemption rights, conversion features, dividend & liquidation preferences and control attributes.

Once a venture capitalist has decided to make an investment, its pricing is based on three factors: the required rate of return, the time involved and the expected value under the anticipated exit strategy (IPO? Sale? Buy-back?).

Assume that a venture capitalist is willing to supply \$5 million to a new software company and that the Exit Value is expected to be between \$70 million and \$100 million on an IPO in five years. Based on the company's state of development, the required Rate of Return is between 40% and 50%.

The following matrix shows that after the financing, the current value is between \$9.2 million and \$18.6 million. Before the financing, the existing shares on this approach are worth between \$5.2 million and \$13.6 million.

<b>Value in</b>	<b>\$ million</b>		
	<b>Discount Rate</b>		
<b><u>5 Years</u></b>	<b><u>40%</u></b>	<b><u>45%</u></b>	<b><u>50%</u></b>
100	18.6	15.6	13.2
90	16.7	14.0	11.9
80	14.9	12.5	10.5
70	13.0	10.9	9.2

## Valuing Computer Software and Software Companies

### Acquired In-Process R & D

Many industries, such as software, electronics, computer hardware, semi-conductors, biotechnology, pharmaceuticals and medical devices have significant on-going in-process R&D. Under APB Opinions Nos. 16 and 17, SFAS No. 2 and FASB 86, such R & D can be written off when the company is acquired.

The key is to:

- Describe the nature of the in-process R & D and determine the stage of development; the write-off is largest immediately before the "Project" becomes a "Product".
- Confirm that at the acquisition date, its technological feasibility had not yet been established and no future alter-native use was known.
- Value the Projects.

The acquirer should apply the same policies in determining the stage of completion of the Acquired In-process R & D as to internally developed projects. Some factors to be considered are: the nature, amount and timing of the remaining expenditures necessary to develop any In-process R & D Project into a commercially viable product.

The SEC has stated that In-process R & D cannot be valued as a "residual" amount similar to Goodwill; they reject the argument that the nature and stage of the acquired company's development implies all excess value beyond identifiable assets to be In-process R & D.

They believe that many other Identifiable Intangible Items exist in business combinations which involve significant technology. While FASB Interpretation No. 4 suggests that the cost of In-process R & D is not a suitable approach to establish its value, the SEC may consider replacement costs of the project to the purchaser.

Our preferred approach is the Adjusted Discounted Cash Flow method; this uses projected cash flows segregated into current, pipeline (In-process R & D) and future products. These cash flows should be discounted at the WACC adjustment for specific risks. The DCF Value must also reflect the tax shield from the deductibility of all costs; the calculations should not assume an economic life of more than seven years with no residual.

## Valuing Computer Software and Software Companies

### PART IX MARKET APPROACH

#### Comparables

Comparables are essential to Market Approach to the valuation process. For Software companies, this is often difficult to implement; for Internet firms, it is almost impossible. The traditional price metrics are:

- Price/Earnings,
- Price/Revenue,
- Enterprise Value (Debt plus Market Capitalization)/EBITDA (Earnings Before Interest, Taxes, Depreciation & Amortization).

However except for Price/Revenue they are not suitable for software companies; we therefore prefer, the relationship: Enterprise Value/EBITRAD (Earnings Before Interest, Taxes, R & D, Amortization and Depreciation).

For businesses involved with the Internet, which is not covered in today's presentation, we dabble in the "new valuation metrics", such as: "eyeballs", "clicks", "doors passed" and "subscribers". In nearly every case, there is a substantial dispersion among multiples and pricing relationships.

Also the definition of comparability may need to be expanded from the type of software to also include other high tech companies with similar:

- Market potential
- Growth prospects
- Lifecycle stage
- Cost structure
- Correlation to the stock market

#### Stock Market/Fair Market Value

The use of public market comparables, is based on the underlying assumption that trading prices in the securities markets represent Fair Market Value. This is not necessarily so, according to John Kenneth Galbraith, in June, 1999:

"The U.S. is having another exercise in speculative optimism, following the partial reversal last year. When you hear it being said that we've entered a new era of permanent prosperity, with prices of financial instruments reflecting that happy fact, you should take cover. Let us not assume that the age of slump, recessions and depressions is past. Let us have both the needed warnings against speculative excesses, and awareness that ensuing slumps can be painful."

## Valuing Computer Software and Software Companies

In 1997, Alan Greenspan, Chairman, The Federal Reserve, sent a brief shudder through the stock market when he referred to "its irrational exuberance". Since then, the Dow Jones Industrial Average has risen about 75%. The Fed's stock market valuation model shows a 48% overvaluation based on comparing the earnings-yield of the S&P 500 Index with the yield-to-maturity on ten-year Treasury Notes.

In view of this market situation, drawing conclusions as to the value of privately owned companies from publicly traded comparables presents considerable difficulties, especially for high-tech companies as opposed to traditional "smoke stack" industries.

On the next page we look at 35 software, computer service and Internet companies in the "Information Week 100 Index", comparing the 52-week highs and lows, as well as the change from the high of the year to August 4, 1999. The table below summarizes the distribution of the high/low ratios and the decreases from the highs. It supports the view that, for these firms, trading prices are not necessarily Fair Market Value.

<b><u>High/Low</u></b> <b><u>more than</u></b>	<b><u>#</u></b>	<b><u>Decrease from High</u></b> <b><u>more than</u></b>	<b><u>#</u></b>
6X	7	60%	9
5X	6	50%	5
4X	3	40%	3
3X	10	30%	1
2X	6	20%	7
1X	<u>3</u>	10%	<u>10</u>
	<u>35</u>		<u>35</u>

## Valuing Computer Software and Software Companies

### Selected Publicly Traded Software & Internet Companies

Company	Price	52 weeks		High	Decrease
	<u>Aug. 4</u>	<u>High</u>	<u>Low</u>	<u>/Low</u>	<u>from High</u>
	\$	\$	\$		%
Adobe Systems	83.38	93.63	23.63	4.0	10.9%
Amazon.com	88.04	221.25	21.67	10.2	60.2%
America Online	87.75	175.50	17.25	10.2	50.0%
Aspect Development	18.13	45.00	6.25	7.2	59.7%
@Home	41.00	99.00	11.75	8.4	58.6%
Baan Co.	12.69	40.75	6.88	5.9	68.9%
BEA Systems	23.56	32.13	8.69	3.7	26.7%
BMC Software	50.63	64.88	30.00	2.2	22.0%
Checkpoint Software	64.88	72.50	10.88	6.7	10.5%
Computer Associates	45.31	58.00	26.00	2.2	21.9%
Computer Sciences	65.19	74.88	46.25	1.6	12.9%
Documentum	14.25	54.13	9.38	5.8	73.7%
Epicor Software	4.25	22.75	4.25	5.4	81.3%
Hummingbird	16.50	25.25	14.00	1.8	34.7%
Hyperion Solutions	17.25	37.38	9.88	3.8	53.9%
IBM	118.50	139.19	55.38	2.5	14.9%
Informix	7.00	14.00	3.50	4.0	50.0%
i2 Technologies	26.19	48.38	9.25	5.2	45.9%
J.D. Edwards	14.75	49.50	10.88	4.5	70.2%
Keane	22.25	58.25	17.25	3.4	61.8%
Kronos	47.13	54.50	16.67	3.3	13.5%
Legato Systems	69.88	82.81	27.50	3.0	15.6%
Lernout & Hauspie	31.38	52.13	25.76	2.0	39.8%
Microsoft	84.94	100.75	43.88	2.3	15.7%
Network Associates	16.63	67.69	10.06	6.7	75.4%
Oracle	36.75	41.17	12.13	3.4	10.7%
PeopleSoft	13.06	39.22	11.50	3.4	66.7%
Rational Software	29.63	40.00	10.50	3.8	25.9%
Saga Software	10.75	27.06	4.75	5.7	60.3%
SAP	30.63	58.81	23.75	2.5	47.9%
Sterling Software	23.81	30.63	18.56	1.7	22.3%
Sybase	10.50	13.38	4.50	3.0	21.5%
Symantec	27.88	32.25	8.69	3.7	13.6%
Veritas Software	53.38	63.44	11.88	5.3	15.9%
Yahoo!	121.00	244.00	29.50	8.3	50.4%
<b>Analysis</b>					
<i>High</i>				10.2	81.3%
<i>Low</i>				1.6	10.5%
<i>Median</i>				3.8	39.8%
<i>Mean</i>				4.5	39.5%

## Valuing Computer Software and Software Companies

### Revenue Multiples

According to Broadview Associates, a specialized investment banking firm located in Fort Lee, New Jersey, the Median Adjusted Price/Revenue multiples for software company acquisitions in the last four years were:

	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>
<b>1995</b>	1.57	2.00	2.91	2.77
<b>1996</b>	2.31	3.25	2.74	1.97
<b>1997</b>	3.36	2.65	2.83	2.37
<b>1998</b>	3.89	3.16	3.31	3.62

For the Period

For the Period	
1st Quarter Median	8.00 X
2nd Quarter Median	3.09 X
3rd Quarter Median	1.85 X
4th Quarter Median	0.79 X

### Do IPOs Make Good Guidelines?

Initial Public Offerings are a potential source of guideline companies. The number of IPOs in the United States declined by 28% in 1997, and 40% in 1998. For technology companies, the drop was 32% each year. While the number of Software and Internet Companies also fell, their share of the total increased.

	<b>1996</b>		<b>1997</b>		<b>1998</b>	
	<b>#</b>	<b>%</b>	<b>#</b>	<b>%</b>	<b>#</b>	<b>%</b>
Technology*	317	36.3	215	34.2	147	39.3
Other	557	63.7	413	65.8	227	60.7
Total	874	100.0	628	100.0	374	100.0
*-Software & Internet	79	9.0	67	10.7	54	14.4

*Source: IPO Monitor.com*

Using IPO offering prices to establish the value of private software companies is an enticing, but in our view totally unrealistic approach. For a project in early 1998, a well-known valuation firm prepared a Study of 38 software IPOs in 1997, to value a private company at December 31 of that year.

Based on statistical analyses, their conclusion was that software IPOs were priced at 8.4 times past revenues, and that at that date, the private software company was worth that multiple. While the

## Valuing Computer Software and Software Companies

statistical relationship (correlation) was strong, no causal connection was demonstrated, and my experience as an investment banker in pricing IPOs did not agree with the conclusion.

The period chosen was a year in which the stock market, as measured by the S&P 500, increased 31%. With high "investor enthusiasm", revenue multiples of IPOs would be expected to increase; this did not occur, as shown by the median price/sales multiples for each quarter:

	<b>Companies</b>	<b>1998</b>
First Quarter	9	9.8X
Second Quarter	11	6.8X
Third Quarter	8	9.9X
Fourth Quarter	9	8.5X
1998	1	19.4X
Year	38	8.7X

This suggests that the market for small software IPOs, in the Study's sample, differs from the traditional stock market. Investors purchase such IPOs expecting very rapid revenue growth and are willing to accept continued losses from R&D and marketing costs. Of the 38 companies in the Study, only 50% had profits at their IPO; for eight, losses exceeded 40% of revenues.

Our experience is that the stock market prices shares of technology companies on their future prospects. The price craters that occur when companies fail to meet analysts' expectations support this view. Therefore IPO pricing is not based on the Financial Statements in the Prospectus, but on the Underwriters' anticipation of the relative future. Traditionally, IPOs have been priced on projected P/E ratios from publicly traded comparables, adjusted for growth rates, less a discount of 10% to 20%.

Due to the rise in stock prices during the year, we felt that the only transactions in the second half of the year for firms of about the same size as the private company, were applicable to its December 31, 1997 valuation; this reduced the sample to nine. For these, we recalculated the Price/Revenue ratios, using the IPO offering price, 1997 reported Revenues and the weighted average number of shares outstanding for the year.

The table below sets out, for each company, the growth in revenues during 1997, and the Price/Revenue ratios from CVS and the Study.

## Valuing Computer Software and Software Companies

Name	Sales	P/R Ratio	
	Growth %	CVS	Other
FlexInternational	157	7.1X	21.6X
Omtool	131	5.4	12.3
UBICS	127	2.6	7.1
Information Advantage	118	2.8	7.6
ProBusiness	92	2.9	8.9
Made2Manage Systems	72	1.1	3.4
Omega Research	64	7.9	13.6
TSI International	40	2.0	4.3
Tier Technologies	38	1.9	5.6
Mean	n/a	3.9	9.4
Median	92	2.8	7.6

The CVS numbers are similar to the median Price/Revenue ratios for the appropriate SIC codes in Ibbotson's Cost of Capital Quarterly 1997 Year Book, and those for acquisitions in 1997 from Mergerstat.

### **PART X MEDIAN BENCHMARK RATIOS FROM PUBLIC COMPANIES**

The following four pages set out median benchmark ratios from public companies for four of the five categories of Application Software covering the last three years. Internet companies are not covered in this presentation. The figures are from Deloitte & Touche Financial Advisory Services Group.

## Valuing Computer Software and Software Companies

### Enterprise Software

	1996	1997	1998
<b>Operating</b>			
Gross Margin (%)	57.2	57.9	65
S G & A (%)	58.1	64.9	46.4
R & D (%)	17.6	17.9	12.6
Net Margin (%)	3.8	-1.4	10.6
<b>Financial</b>			
Current Ratio	2.6	2.6	1.7
Receivables (days sales)	99.6	95.8	103
Payables (days)	59.8	52.6	48.4
Working Capital (days)	156.4	177.5	95.5
<b>Efficiency</b>			
Asset Turnover (times)	1	1	1
Sales/Employee (\$'000)	160.2	136	205.1
Return on Assets (%)	6	0.8	18.5
Return on Equity (%)	7.4	0.8	21.4
<b>Valuation Multiples</b>			
Sales	2	2.8	3.6
Cash Flow	17.1	13.2	25.9
Net Income*	17.9	35.6	37.4
Book Value	2.7	4	8.5

\* excludes loss companies

Source: Deloitte & Touche Financial Advisory Services Group

## Valuing Computer Software and Software Companies

### Packaged Software

	1996	1997	1998
<b>Operating</b>			
Gross Margin (%)	68.5	68.7	70.7
S G & A (%)	68.1	74.0	62.5
R & D (%)	21.1	24.4	18.4
Net Margin (%)	(4.1)	(12.1)	3.7
<b>Financial</b>			
Current Ratio	2.4	2.4	2.2
Receivables (days sales)	66.6	77.1	58.3
Payables (days)	76.6	67.9	67.7
Working Capital (days)	189.4	157.5	163.7
<b>Efficiency</b>			
Asset Turnover (times)	0.9	1.0	1.0
Sales/Employee (\$'000)	146.7	146.6	274.2
Return on Assets (%)	(0.7)	(1.7)	10.1
Return on Equity (%)	(2.9)	(6.4)	7.3
<b>Valuation Multiples</b>			
Sales	1.7	2.0	2.1
Cash Flow	(0.8)	(1.1)	12.2
Net Income*	16.8	38.5	22.7
Book Value	2.5	3.2	4.2

\* excludes loss companies

Source: Deloitte & Touche Financial Advisory Services Group

## Valuing Computer Software and Software Companies

### Technical Software

	1996	1997	1998
<b>Operating</b>			
Gross Margin	78.1%	71.8%	76.3%
SG&A	62.3%	64.7%	61.9%
R&D	21.4%	19.9%	24.8%
Net Margin	-4.1%	5.2%	8.6%
<b>Financial</b>			
Current Ratio	2.4	2.4	2.1
Receivables (days sales)	74.0	75.8	76.0
Payables (days)	46.1	59.6	56.4
Working Capital (days)	166.4	161	124.6
<b>Efficiency</b>			
Asset Turnover (times)	0.9	0.9	1.0
Sales/Employee (\$'000)	174.3	173	217.8
Return on Assets	11.1%	7.3%	12.2%
Return on Equity	8.0%	4.9%	11.0%
<b>Valuation Multiples</b>			
Sales	2.2	2.0	2.6
Cash Flow	17.1	14.2	18.2
Net Income*	17.9	35.6	16.1
Book Value	2.7	4.0	3.4

\* excludes loss companies

## Valuing Computer Software and Software Companies

### Edutainment Software

<b>Operating</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
Gross Margin (%)	56.9	36.8	50.2
SG&A (%)	64.2	60.7	47.1
R&D (%)	26.1	27.4	15.1
Net Margin (%)	(18.9)	(22.8)	5.1
<b>Financial</b>			
Current Ratio	2.1	1.6	3.1
Receivables (days sales)	82.7	82.0	62.5
Payables (days)	70.5	66.0	53.0
Working Capital (days)	153.3	107.4	142.6
<b>Efficiency</b>			
Asset Turnover (times)	0.8	0.9	1.3
Sales/Employee (\$'000)	152.0	141.2	448.7
Return on Assets (%)	(6.8)	(25.9)	15.4
Return on Equity (%)	(10.1)	(5.9)	12.5
<b>Valuation Multiples</b>			
Sales	2.0	2.0	3.3
Cash Flow	(0.8)	(1.2)	26.2
Net Income*	16.8	34.8	29.6
Book Value	2.5	3.1	4.4

\* *excludes loss companies*

### PART XI - CASE STUDY "A"

#### CREATION OF VALUE IN A SOFTWARE COMPANY 1994 VALUATION

##### Background

In July, 1994, Joiner Inc. ("Joiner", or the "Company"), a systems integrator concentrating on E-mail systems for Financial Institutions, engaged Corporate Valuation Services Limited ("CVS") to value the Company as at its fiscal year end, May 31, 1994. Joiner was owned by three partners with holdings of 40%, 40% and 20% respectively; one 40% owner wished to retire. The purpose of the Valuation Report was to establish the amount to be paid for his shares.

The cash available for their purchase was limited, as the Company was relatively small (revenues of \$2,889,000) and in the process of becoming a products rather than services business. Therefore, the partners had agreed that \$1,250,000 of the value would be converted pro rata into non-voting, non-participating Class A shares, with a stated value of \$0.05 a share, but redeemable at \$10.00

## **Valuing Computer Software and Software Companies**

each. The remaining common shares, held by the retiring partner, would be purchased equally by the other 40% shareholder and a number of key employees.

### **The Company**

Joiner had been formed in 1985 as a supplier of electronic office automation services; its corporate mission was "to develop, market and support electronic messaging connectivity throughout the world". Between 1987 and 1992, in conjunction with Soft-Switch, Inc., it developed five messaging Gateways; these connected LAN-based electronic mail ("E-mail") systems directly with other such systems, with host-based units relying on IBM's messaging protocols ("SNADS" or "PROFS"), or with "Soft-Switch Central E-mail Systems". These products were sold exclusively by Soft-Switch to Fortune 500 companies; Joiner was not permitted to sell them, but could use them in its systems integration business.

Soft-Switch's exclusive distribution rights expired in 1992, and the Company began creating a direct sales organization for these products; this was in competition with Soft-Switch, which retained a non-exclusive license to use the technology in its own systems.

In 1992, one customer, a major life insurance company, acquired a smaller competitor; this newly merged organization found itself dealing with five different E-mail systems, both LAN and host-based. The Company was invited to propose a solution to the problem. It installed Gateways, linking the various systems, and also developed the initial version of a "Directory Exchange"; this per-mitted users of one E-mail system to enter E-mail addresses on another system in their normal format, as the Directory Exchange synchronized the directories of all five E-mail systems.

As well as selling Gateways and a Directory Exchange, in 1994, the Company became a Value Added Reseller (VAR) of "OpenMail", a Hewlett-Packard UNIX-based E-mail system. The objective was to offer large organizations a complete range of communication solutions that would link LAN, UNIX, and host-based E-mail systems and other messaging applications.

## Valuing Computer Software and Software Companies

### Operating Results

<b>Year Ended May 31</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>
<b>Revenues</b>	Projected				<b>\$'000</b>
Products	230	544	1,264	1,312	2,600
Services	<u>1,919</u>	<u>1,837</u>	<u>1,532</u>	<u>1,577</u>	<u>650</u>
	<u>2,149</u>	<u>2,381</u>	<u>2,796</u>	<u>2,889</u>	<u>3,250</u>
<b>Expenses</b>					
Operating	1,871	2,210	2,249	2,203	2,770
R&D	<u>93</u>	<u>221</u>	<u>293</u>	<u>464</u>	<u>625</u>
	<u>1,964</u>	<u>2,431</u>	<u>2,542</u>	<u>2,667</u>	<u>3,395</u>
Pre-Tax Profit (Loss)	185	(50)	254	222	(145)
Income Tax	<u>(43)</u>	<u>-</u>	<u>(47)</u>	<u>(56)</u>	<u>-</u>
Net Income	<u>142</u>	<u>(50)</u>	<u>207</u>	<u>166</u>	<u>(145)</u>

### Situation Analysis

#### *Strengths*

- No further R & D breakthroughs are necessary, only continued product development and improvements to create a Directory Exchange linking virtually all types of E-mail
- Very strong technical staff with considerable expertise and product management skills
- Excellent SNADS and PROFS gateway products
- Automated problem tracking system for customer support
- Experienced and dedicated Management that understands the IBM "glasshouse" mentality
- Distribution rights for OpenMail.

#### *Weaknesses*

- Most of the existing products run on O/S 2, the others on Windows, so the developers have good experience in these, but lack UNIX and TCP/IP skills
- Only a collection of products, not an integrated product line
- Numerous versions of each product, each with limited documentation and information
- Scalability of Directory Exchange not yet demonstrated
- Customers require significant product support
- Nobody has the responsibility for testing and quality assurance
- No effective sales channels for new products
- Senior Management lacks marketing skills and international experience
- Projected losses in both 1995 and 1996 may lead to diminished support from bankers.

## Valuing Computer Software and Software Companies

### *Opportunities*

- Complete backbone messaging solution
- To supply VARs and OEM customers with integrated product line that will globally interconnect over 50% of all E-mail users.

### *Problems*

- Possible loss of key people
- Slow growth of OpenMail; Hewlett-Packard could change its marketing model
- International vulnerability concerning patents and trademarks
- Lack of acceptance by large companies due to small size
- Customer dissatisfaction because of inability to put products into production on schedule
- Leap-frogging by competitors will require continued product improvement.

### **Questions**

1. How is Joiner positioning itself?
2. At what Lifecycle stage are its products?
3. Which is the Lifecycle stage of the Company?
4. Which approaches would you use to value Joiner in 1994?
5. What additional data do you need?
6. What Intangible Assets are not shown on the Balance Sheet?

## **PART XII SELECTIONS FROM 1994 JOINER VALUATION REPORT**

### **Capitalization Rate**

#### *From Comparables*

The closest comparable US company is Attachmate, which Joiner considers to be its major competition. Attachmate filed an Initial Public Offering in May 1994. However, CVS does not consider it an appropriate comparison for the Company, as it had revenues in 1993 of \$145 million and 1993 profits of \$21,900,000 (\$0.88 a share).

The Attachmate IPO price was estimated to be between \$13.00 and \$15.00, reflecting Capitalization Rates of 6.8% to 5.9%. As the Company is a much smaller, private firm, and a minority interest is to be sold, the applicable Capitalization rate would be increased to between 9.9% and 10.8%. The Attachmate IPO price was estimated to be between \$13.00 and \$15.00, reflecting Capitalization Rates of 6.8% to 5.9%. As the Company is a much smaller, private firm, and a minority interest is to be sold, the applicable Capitalization rate would be increased to between 9.9% and 10.8%.

## **Valuing Computer Software and Software Companies**

### **Build-Up Approach**

The specific risks applicable to the Company are as follows:

#### *Management*

Experienced and dedicated, but with limited marketing knowledge; with the changing nature of the business, this area will be crucial to the Company's success.

#### *Size*

The Company is small and competes against larger and better known entities; its target customers, Fortune 2000 companies, tend to be concerned about continuity among suppliers.

#### *Product Range*

At the Valuation Date, the Company did not have a complete product range, but offered a number of individual items; additional products are expected to be developed and an integrated suite for backbone messaging completed by May, 1995.

#### *Dependence*

The proposed strategy involves the Company becoming dependent on the success of Hewlett-Packard's OpenMail. This is a UNIX product, and there is a substantial possibility that PC-based LANs rather than UNIX products will replace mainframe E-mail.

#### *Location*

Joiner is located in Canada and competes in the international market. The bulk of its costs will be in Canadian dollars and much of its revenue in US funds. At present exchange rates, the Company is competitive; however, its profitability would be adversely affected by any strengthening of the Canadian currency.

#### *Ease of Entry*

The connectivity business, which links proprietary products from Joiner with those of other vendors, does not require substantial physical resources, as it is based on intellectual property. Therefore, there are few barriers for an experienced programming team to commercialize in-house developed products; 12% of organisations with E-mail use "home grown" messaging software.

## Valuing Computer Software and Software Companies

As shown below, the Build-up approach gives a Capitalization Rate of 9.7%.

Bond Rate	7.3
Equity Premium	13.3
Specific Risks	
Management	1.0
Capitalization	0.0
Size	1.0
Product Range	1.0
Dependence	3.0
Environmental Impact	0.0
Government Regulations	0.0
Location	0.5
Ease of Entry	1.0
Profit Margins	0.0
Technology in Use	<u>0.0</u>
	<u>27.2</u>
Growth Rate	<u>(17.5)</u>
Capitalization Rate	<u>9.7%</u>
Earnings Multiple	<u>10.3 x</u>

### Transaction Based Value

For a Transaction Based Value, CVS looked at acquisitions in late 1993 and early 1994, four in the connectivity industry and three general software companies. All the transactions related to businesses much larger than the Company, therefore their price/sale ratios needed adjustment.

<b>\$ Million</b>		<b>Date</b>	<b>Sales</b>	<b>Price</b>	<b>Price/Sale</b>
<b>Connectivity</b>					
SoftSwitch	Shares	6/94	23.6 E	54.6	2.31
KEA System	Assets	12/93	9.6	10.1	1.05
Beyond Inc.	Shares	3/94	9.0 E	17.5	1.94
DaVinci	Shares	6/94	5.0 E	8.5	1.70
<b>General Software</b>					
KnowledgeWare	Shares	7/94	130.0	143.0	1.10
Pilot	Shares	4/94	37.0	40.0	1.08
Rapid Entries	Shares	12/93	5.6	7.5	1.34
<i>E - Estimate</i>					

The Company is noticeably smaller than KEA or any of the other firms considered, and only a minority interest will be sold. In view of this, CVS believes that the appropriate price/sales ratio

## Valuing Computer Software and Software Companies

is 0.566, based on applying a minority discount of 23%, and a size discount of 30% to the KEA ratio.

### Net Worth/Goodwill Value

<b>Financial Position</b>	<b>\$,000</b>
Cash	144
Receivables	592
Tax recovery	471
Prepaid	<u>16</u>
	1,223
Equipment-net	<u>204</u>
	<u>1,427</u>
Payables	157
Deferred Revenue	<u>180</u>
	<u>337</u>
Net Worth	<u>1,090</u>
,	<u>1,427</u>

### Value of R & D

Most software companies write off R & D as incurred; however, it usually has a significant value; this is especially true when, as with Joiner, the business is changing from a supplier of services to a marketer of products. Based on an average life of eighteen months for a computer program, the first approximation of the value of the R & D is 50% of the expenditures incurred during the last three years, after tax at the Company's effective rate of 23%.

### Value of Installed Base

The other unrecorded asset of the Company is its installed base. At May 31, 1994, there were 720 installations, including those sold by Soft-Switch, for which the Company receives royalties. Based on the cost of acquiring a customer, each of these is worth at least \$250, giving a value of \$180,000 for the installed base.

### Indication of Fair Market Value

Three approaches were considered, which gave results ranging from \$1,635,000 to \$1,711,000, with a mean of \$1,664,000.

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		\$'000
<b>Net Income Value</b>		
1994 Net Income	<u>166</u>	
Capitalized at 9.2%		<u>1,711</u>
<b>Transaction Based Value</b>		
1994 Revenue	<u>2,889</u>	
Multiple 0.566		<u>1,635</u>
<b>Net Worth/Goodwill Value</b>		
1994 Tangible Net Worth	1,090	
Three years R & D less 50%	489	
Less Tax at 23%	(112)	
Installed Base	<u>180</u>	<u>1,647</u>

### Conclusion

Our conclusion was that the Fair Market Value of all the shares was \$1,650,000; this was allocated \$1,250,000 to the new class A shares and \$400,000 to the common. Therefore, the purchasing partner and employees had only to spend \$160,000 to buy out the retiring individual.

### Questions

1. As a Valuation Analyst, do you agree with the approaches selected?
2. Do you consider the information supplied sufficient?

## PART XIII JOINER INC. - CASE STUDY "B"

### 1996 Situation

In the fall of 1994, Joiner asked CVS for advice as to how to in-crease the value of the enterprise. At that time, Management had become aware of the problems of developing for more than one operating system: OpenMail used UNIX, some of the Gateways and Directory Exchange ran on OS/2, while the remainder of the products were on Windows.

An analysis of the principal E-mail systems showed that in 1995 new products would be introduced by Microsoft (Exchange), Lotus (Notes 4.0) and Novel (Open Messaging Environment). As all of these ran on Windows NT, which in version 3.5 was becoming a widely accepted, improved product, CVS recommended that Joiner standardize on this platform for all its proprietary products.

Late in 1994, an approach was made to Joiner by Control Data Systems, a systems integrator serving Fortune 100 companies. Control Data wished to make use of the Company's talents and was prepared to invest \$925,000 for a 50% interest; the funds would be used to redeem class A

## Valuing Computer Software and Software Companies

shares. As the objective was to make use of the Company's systems integration experience and not continue development of the products, the approach was rejected. However, the offer indicated that the organization and installed base could have a higher value than reflected in the 1994 Valuation Report.

### Operating Results

The results for the two fiscal years to May 1996, as shown in the table below, were disappointing. The major reason was that Directory Exchange, due to be completed in October 1995, did not enter Beta testing until March 1996. At the same time, sales of existing products dropped off sharply, which was mainly due to increased competition following IBM's acquisition of Lotus and its subsidiary, Soft-Switch, in 1995.

While Management was successful in controlling operating costs, it could not offset the poor sales; these problems were accentuated by the resignation of the VP Sales, who left to start his own business in late 1995. Based on this record, we doubted that Joiner would reach its 1997 projections.

Year Ended May 31	\$000				
	1995 (Proj)	1995 (Actual)	1996 (Proj)	1996 (Actual)	1997 (Proj)
<b>Revenues</b>					
Products	2,600	2,264	4,300	1,590	4,270
Services	<u>650</u>	<u>742</u>	<u>500</u>	<u>627</u>	<u>780</u>
	<u>3,250</u>	<u>3,006</u>	<u>4,800</u>	<u>2,217</u>	<u>5,050</u>
<b>Expenses</b>					
Operating	2,770	2,356	4,000	2,360	3,080
R&D	<u>625</u>	<u>876</u>	<u>900</u>	<u>639</u>	<u>925</u>
	<u>3,395</u>	<u>3,232</u>	<u>4,900</u>	<u>2,999</u>	<u>4,005</u>
Pre-Tax Profit (Loss)	<u>(145)</u>	<u>(226)</u>	<u>(100)</u>	<u>(782)</u>	<u>1,045</u>

### Changes in the Market

As LANs became more prevalent in the mid 1990s, E-mail was one of the major applications. In 1995, the number of electronic mail boxes grew by 75% to more than 90 million, of which about 62 million were in the United States and Canada.

This rapid growth resulted in a number of problems: the largest supplier, IBM/Lotus, with over 20% of installed E-mail boxes, uses four different addressing schemes (cc:mail, Notes, PROFS and SNADS), none of which are compatible with those of Microsoft (MS Mail and Exchange), the second largest supplier.

## Valuing Computer Software and Software Companies

Merger activity had resulted in large corporations operating multiple E-mail platforms.

- There is a limited number of means of exchanging messages and documents between users of different E-mail systems.
- It is extremely difficult to efficiently manage the addresses of large groups of E-mail participants within a large organization using several systems so that everyone can communicate with everyone else.

The last problem, directory synchronization, had become such a significant issue by early 1996 that, in a survey by Forrester Research (Boston) of 34 Fortune 1000 companies, 29 (85%) listed "no directory synchronization" as their answer to the question "what prevents further rapid growth of E-mail?"

In view of this and the collapse of the market for OpenMail, the Company changed its focus and made Directory Exchange its principal product, aiming at the target market of Fortune 2000 companies and their foreign equivalents. A survey of 180 technical managers at such organizations indicated that E-mail is one of the three application areas where spending would increase by over 50% in 1996. Many of these firms are planning to implement strategic Client/ Server applications consisting of Notes 4.0 or Exchange.

These new products are incompatible with nearly all existing E-mail systems; therefore, to obtain major corporate sales, IBM/Lotus and Microsoft had to provide easy, flexible migration solutions that automatically converted the directories and other services to their new platforms, while ensuring reliability and efficiency.

The Company had successfully installed version 1 and version 2 of its Directory Exchange at a number of major companies, such as ManuLife Financial, Hertz, and Fidelity Investments. Version 3, which was designed to totally automate the process and be fully compatible with "Notes 4" and "Exchange", was successfully Beta tested by USA Today and Exxon in the spring of 1996. Joiner in-tends to piggy-back Directory Exchange version 3 on the extensive sales campaigns underway by Lotus and Microsoft for their new products.

Running on Windows NT and intended to support tens of thousands of users, version 3 allows the SysOp to monitor and manage the whole Directory Exchange process from one single point; it enables the administrator to start, monitor and stop the directory synchronization process at any time, as well as creating the message and trace logs that track and record delivery errors and problems.

### Competition

Joiner's primary competitors are Soft-Switch (a unit of IBM/Lotus), Worldtalk, and Control Data Systems. The Soft-Switch product, "Lotus Messaging Switch" requires a Data General

## Valuing Computer Software and Software Companies

minicomputer. Including software, these systems cost a minimum of \$150,000, compared with the Company's alternative at about \$50,000. As Soft-Switch uses the Company's technology to link LAN E-mail to host-based systems, Joiner receives royalties from virtually all Soft-Switch sales.

Worldtalk entered the directory synchronization market in 1993. Although it is competitive with the Company's product on price for LAN E-mail, it does not have connectivity to IBM and other host-based systems.

Control Data also participates in directory synchronization as part of its message switching business. However, it is primarily a systems integrator and offers labor intensive solutions, which are generally not economic for Fortune 2000 customers.

### Questions

- In raising Venture Capital, what approaches would you use to value Joiner?
- As a Venture Capitalist, what Rate of Return would you require from Joiner?
- Why?

## PART XIV EXTRACTS FROM FUND RAISING DOCUMENTS

### 1996 Value

#### *Market Approach - Transaction-Based Value*

Since 1994, prices paid for software companies have increased sharply. According to an industry database from The Corum Group Ltd. in Bellevue, Washington, the average transaction in privately held software companies then took place at 1.5 times their revenues, less liabilities; by March 1996, two years later, this ratio had increased to about 2.2 times.

Because of sales dropping off and delays bringing Directory Ex-change version 3 to market, the Company's financial position had deteriorated. At its year-end, May 31, 1996, it had liabilities of \$1,152,000 and not only no working capital, but also almost no shareholders' equity. Applying a price/sales ratio of 2.2 to revenues of \$2,217,000 gives \$4,877,000 before the deduction of liabilities, and \$3,725,000 as a Transaction-Based Value of Joiner's shares.

## Valuing Computer Software and Software Companies

### Asset Approach - Net Worth/Goodwill Value

<b>Financial Position</b>	<b>1994</b>	<b>1996</b>
Cash	144	-
Receivables	592	503
Tax recovery	471	632
Prepaid	<u>16</u>	<u>8</u>
	1,223	1,143
Equipment-net	<u>204</u>	<u>91</u>
	<u>1,427</u>	<u>1,234</u>
Payables	157	606
Bank Overdraft	=	<u>331</u>
Deferred Revenue	<u>180</u>	<u>215</u>
	<u>337</u>	<u>1,152</u>
Net Worth	<u>1,090</u>	<u>82</u>
	<u>1,427</u>	<u>1,234</u>

### Value of R & D

From its own resources, between 1992 and 1996, the Company spent \$2,493,000 on R & D. In Canada, R & D expenditures by Canadian controlled companies are eligible for Scientific Research and Experimental Development (SR & ED) tax credits at the rate of 35%; such tax credits are paid in cash to a private company. Joiner qualifies, and, as shown on the Balance Sheet, was to receive a substantial tax recovery.

Adjusting the \$2,493,000 charged to R & D for the tax credits gives \$3,835,000 as the total R & D in the five years, with \$3,146,000 spent on Directory Synchronization. A further \$540,000 had been budgeted for fiscal 1997 to ensure a state-of-the-art product.

In view of the Company's lead in this area, and that it would take any competitor at least twelve months to create a similar product, CVS believes that the value of the R & D was at least \$3,146,000, the accumulated expenditures on Directory Synchronization.

### Value Of Installed Base

The other unrecorded asset is Joiner's installed base. At May 31, 1996, there were 1,042 installations, including those sold by Soft-Switch. Based on the approach by Control Data, they were worth at least \$350 each, giving a value of \$365,000 for the installed base.

## Valuing Computer Software and Software Companies

### Conclusion

Based on the numbers set out above, the Net Worth/Goodwill Value of the Company was \$3,593,000.

	\$'000
Net Worth	82
Products	3,146
Installed Base	365
	3,593

### Indication of Fair Market Value

The two methods used gave values of \$3,725,000 and \$3,593,000, with a mean of \$3,659,000; rounded to \$3,650,000, this formed CVS's Indication of Fair Market Value.

Do you agree?

## PART XV JOINER'S 1996 FINANCING

### Proposed Financing

In April 1996, the directors of Joiner, with the assistance of a Big Six accounting firm, decide to establish a holding company for the current shareholders and to offer 25% of the existing company for \$1,000,000. This is equivalent to a value of \$3,000,000 for the existing shareholders, representing a minority discount of 17.8% from the Fair Market Value of \$3,650,000.

### Actual Financing

The first venture capitalist to review the situation felt that raising \$1 million did not supply enough working capital; he believed that at least \$1,500,000 was required, and offered \$1,850,000 for a 40% interest. This gave a value of \$2,775,000 for the existing shares a 24.0% discount. The Board rejected this and sought a better offer.

A glowing report from Exxon on the Beta test, which was followed by a production order, allowed the Company to convince two venture capital firms that a \$3,500,000 value was appropriate. In July 1996, one offered \$1,500,000 for preferred shares, with Warrants to convert to 30% of the common. The Warrant exercise price would be adjusted downwards if Joiner missed its projections for 1997 and 1998. The transaction closed in early August.

## Valuing Computer Software and Software Companies

### Questions

1. If you had been the valuation analyst for the venture capitalist, would you have considered this deal fair? If so, why?
2. If not, what would you have advised your client to do?

### **PART XVI JOINER INC. - CASE STUDY "C" - APPROACH BY MICROSOFT**

#### **Here's How the Plot Thickened.....**

The Company did very well; Directory Exchange crossed the CHASM, as the product spurred revenue growth from \$409,000 in the first quarter (June to August 1996) of fiscal 1997, to \$1,318,000 in the third quarter (December 1996 - February 1997). Sales for the last quarter were forecast at \$2,000,000 based on orders on hand; for the year, at least \$4,921,000 (97% of the \$5,050,000 projected) would be achieved. As most cost were substantially fixed, the higher sales restored profitability, even though R & D had in-creased to an annual rate of \$1 million.

At the pre-tax level, the Company moved from a loss of \$306,000 in the first quarter to a profit of \$227,000 in the third; for the last quarter, the projected profit was \$775,000. In February, marketing and support deals were entered into with Amdahl, a subsidiary of Fujitsu K.K., and Digital, mainly for Europe; this gave the Company's products a twenty-four hours a day, seven days a week support capability virtually everywhere.

In mid-March, Microsoft approached the Company, offering to purchase it for \$16 million. I responded with the attached memo, with the names and amounts changed, suggesting a value to Microsoft of \$34 million.

#### **Questions:**

1. Do you agree with my conclusions?
2. What other valuation approaches would you adopt?

## Valuing Computer Software and Software Companies

### CORPORATE VALUATION SERVICES LIMITED

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March 18, 1997

TO : President of Joiner  
BY FAX : (416) 999-9999

COPY : Venture Capitalist  
BY FAX : (415) 999-9999

FROM : James P. Catty

TOTAL PAGES: 5

Re: Value of Joiner to Microsoft

Following our discussions this morning, I am setting out my views of the value the acquisition of Joiner has to Microsoft. All amounts are in US dollars, unless otherwise stated.

It appears that IBM considers Notes to be a strategic vehicle, not only as a messaging mechanism, but also as a means of distributing mainframe data and applications. They are quoted as having 1,000 programmers dedicated to converting PROFS applications to Notes at the rate of about 100 to 200 per month.

From a strategic point of view, the acquisition can give Microsoft four advantages:

1. "Notes Containment" An acquisition would immediately add a tested Notes/Exchange connector and Notes/Exchange Directory Synchronization capabilities to Exchange, in time for Version 5.5 in September, 1997. Migration tools for Notes applications, using these technologies, will be available in three months.

There is no doubt that Microsoft could build all of these and successfully roll them out. The question is how long it would take, including testing, and how many seats of Notes, rather than Exchange, would be sold in that period.

## Valuing Computer Software and Software Companies

In my view, as development must, in part, be sequential, it would take Microsoft at best twelve and probably about eighteen months to have all three products fully tested and commercially available. In the same period, Joiner could roll out at least two upgrades of all of them.

Currently, Notes has about nine million seats, compared with around two million for Exchange. In the next year, Notes expects to add another six million seats. With full Notes connector capabilities integrated into Exchange Version 5.5, Microsoft should have a reasonable chance of obtaining 50% of these seats. For this analysis, I have used 25%, or 1,500,000 additional seats of Exchange.

A further potential market for Microsoft, with Notes capabilities integrated into Exchange Version 5.5, is represented by the many users of Notes as a Mailer rather than a Workgroup product; these are estimated at two-thirds of the total In-stalled Base. With the better mail transport of Exchange, and Joiner's calendaring ability, available through its license to use the Attachmate software recently acquired by Control Data Systems, it is likely that a large number of existing Notes Mail users would like to convert to an Exchange backbone; my estimate is 1,000,000 over time.

Thus a "Buy" rather than "Build" approach gives Microsoft the potential of selling a further 2,500,000 seats of Exchange, which otherwise would go to Notes, as a result of the much faster time to market. Using an average revenue of \$40 per seat, this opportunity could generate \$100 million in potential revenue for Microsoft, and create at least a \$10 million value for Joiner.

2. "Plucking the Low Hanging Fruit" There are more than 40 million seats of host-based mail systems looking for a migration path.

Some of these enterprise systems are mainframe-based and some are LAN based; all are candidates for Exchange. However, Microsoft considers itself a "shrink wrap" company without the capability of supplying service at the level expected by "glass house" operations. Recent agreements with Digital and Amdahl (pending) will supply Joiner products with 7/24 service capability throughout the world.

Joiner has already built connectors for nearly all of the host-based systems so that they can co-exist with and migrate to Exchange. By integrating these and the Directory Synchronization capability into Exchange Version 5.5, Microsoft could outflank IBM, as that firm must rely on Soft-Switch to integrate any orphan (non-IBM) systems into Notes.

Over the next two years, this capability has the potential of adding between 16,000,000 (40%) and 24,000,000 (60%) seats of Exchange. Using the minimum, and ascribing a value of only \$1.00 per potential seat, this opportunity adds \$16,000,000 to the value of Joiner.

## Valuing Computer Software and Software Companies

The first two strategic advantages give a value of \$26,000,000 for Joiner:

	<b>\$'000</b>
Notes Containment	10,000
Low Hanging Fruit	<u>16,000</u>
	<u>26,000</u>

There are also two other medium to longer term strategic advantages of an acquisition: "Soft-Switch Displacement" and "Application Distribution".

3. "Soft-Switch Displacement" An integral part of IBM's emerging strategy is the use of Soft-Switch installations for linking disparate mail systems. At present, there are about 700 of these, with 400 using technology licensed from Joiner.

Recently, Joiner has started developing software running on NT platforms, that handle all the Soft-Switch functions including those in the Soft-Switch ATK (Application Tool Kit) Utilities. These capabilities should be available in three months.

Many companies find Soft-Switch installations difficult to manage as they run only on Data General platforms, and would like to replace them with Joiner Software Systems on an NT platform that also runs Exchange on the same server.

Installation of such Systems would be undertaken by system integrators. Based on a retail price of \$100,000 (\$60,000 to Microsoft) and replacement of 350 (50%) Units, the potential revenue is \$21,000,000; this should add \$2 million to the value of Joiner.

4. "Application Distribution" IBM has positioned Notes as a data and application distribution mechanism. This creates an opportunity for Microsoft to replace IBM 3270 terminals with PCs and BackOffice.

For Texaco, Joiner is developing an NJE Connector that will allow Host Applications to be distributed by Microsoft Ex-change Server. NJE is embedded in every IBM native host operating system. Once Joiner replaces Soft-Switch's ATK (see item 3), all components required to link IBM hosts to Exchange Server will be available to Microsoft on an Acquisition.

Conservatively estimated, there are 5,000 installations using mainframe applications; over time, about 25% could switch to Microsoft Exchange distribution facilities. This type of software is sold through system integrators and would retail for about \$200,000, of which \$100,000 a copy would come back to Microsoft. For 1,250 installations, this represents a potential \$125 million in longer term revenue.

## Valuing Computer Software and Software Companies

In my view, the Value of Joiner to Microsoft is \$34 million, made up as follows:

	<b>Potential Revenue</b>	<b>Value</b>
	Seats of Exchange	\$'000
Notes Containment	2,500	10,000
Low Hanging Fruit	<u>24,000</u>	<u>16,000</u>
	<u>26,500</u>	26,000
Soft-Switch Displacement	21,000	2,000
Application Distribution	<u>125,000</u>	<u>5,000</u>
	<u>146,000</u>	33,000
Cash		<u>1,000</u>
		<u>34,000</u>

### Comparables

The best comparables to Joiner among public companies are World-talk, with a market capitalization of about \$80 million, and the smaller ISOCOR, at \$41 million.

Worldtalk is about 2.9 times the size of Joiner, with December, 1996 revenues of \$14.2 million, compared with Joiner (May, 1997) of \$4,900,000. Worldtalk has a better distribution system but considerably inferior products; in fact, they license certain technologies from Joiner. On a comparative sales basis, Joiner is worth \$27,600,000. Adding a 20% control premium and the \$1 million of cash gives a takeover value of \$34 million.

While having a smaller capitalization than Worldtalk, ISOCOR is bigger than Joiner, with sales about the same as Worldtalk. It uses OEM distribution, resulting in lower margins. In our view, ISOCOR is worth only about 20% more than Joiner, as it does not have any similar strategic products. The major reason for the premium is that ISOCOR is a public rather than a private company.

## PART XVII THE SALE

The Company engaged an investment bank to act as an intermediary; this firm came up with \$33,500,000, based on 1996 acquisition prices; it also used a comparison with publicly traded Worldtalk, which gave a value of between \$25,470,000 and \$36,904,000, with a mean of \$31,187,000.

## Valuing Computer Software and Software Companies

### 1996 Acquisitions

Buyer	Target	\$ million		
		Per Share Price	Revenue	Price/Revenue
Filenet	Soros	102.5	15.0	6.83
Integrated Systems	Epilogue	20.0	3.3	6.06
Worldtalk	Deming	<u>6.3</u>	<u>0.5</u>	12.60
Weighted Average		<u>128.8</u>	<u>18.8</u>	6.85

Applied to Joiner's trailing twelve month (TTM) revenues of \$4,921,000, the weighted average Price/Revenue ratio of 6.81 times gives \$33,512,000, rounded to \$34,000,000 as the Acquisition Value.

Worldtalk Comparisons	\$'000	
	TTM 3/31/97	Run-rate 3/31/97
Market Capitalization	61,974	61,975
Annualized Revenue	15,896	17,600
Price/Revenue ratio	<u>3.90</u>	<u>3.52</u>
Joiner Revenue to 5/31/97	4,921	8,000
Implied Value	19,186	28,170
Private Company Discount	15%	15%
Subtotal	16,308	23,945
Control Premium	50%	50%
Adjusted Value	24,462	35,917
Cash	<u>1,000</u>	<u>1,000</u>
Acquisition Value	<u>25,462</u>	<u>36,917</u>
Mean Acquisition Value Rounded		<u>31,200</u>

### Questions

1. What "asking price" should Joiner chose?
2. If you were a valuation analyst for Microsoft, what value would you have put on the Company?
3. Why?
4. What portion of our Acquisition Value of \$34 million did Microsoft pay?
  - a. 100%
  - b. 95%
  - c. 90%
  - d. 80%
  - e. 75%
  - f. did not acquire

## **Valuing Computer Software and Software Companies**

### **One Last "Caveat Valuator"**

Most people resist change; this can manifest itself in many forms, ranging from complete denial to open hostility. Sometimes the resistance proves effective and the status quo lives on; more often, the resisters become road kill.

If you are valuing a software company that does not have a dominant market share and somehow discover that Microsoft is planning to enter the category, ask your client to immediately call a board meeting to discuss drastic changes to his Business Plan.

A number of possibilities are open: try to find out if Microsoft would consider purchasing your product. This has been known to happen - I was involved in one such highly successful deal. Their philosophy is if you can get it for reasonable money, why spend time and effort developing it yourself?

Once upon a time, David did manage to slay Goliath, but it was so unique, it made history; it is unlikely to happen again.

On the other hand, you might investigate prospecting for gold in Colombia, preserving brandied peaches on a large scale, or offer to purchase MIR to be placed alongside the Queen Mary in Long Beach as a new sight-seeing sensation.

### **Sources of Information**

- Periodicals: PC Week, Computerworld, Information Week, PC Magazine, PC World, Windows magazine, etc.
- The Internet
- Industry consulting groups: Gartner, IDC, DataQuest
- Trade shows: Comdex, Supercomm, Network+Interop, CEBIT (Hamburg)
- Investment Studies: Merrill Lynch; Goldman Sachs; Morgan Stanley Dean Witter, Credit Suisse First Boston.