

# Constellation Software Inc.

## TO OUR SHAREHOLDERS

Each quarter we try to study an admirable company and discuss it with our Operating Group managers and board members. We focus on high performance conglomerates that have demonstrated at least a decade of superior shareholder returns. We started by studying those that have generated superior returns for multiple decades. That narrowed the field a lot, so we are beginning to let some single decade performers slip into the candidate pool. I'll refer to the conglomerates that we've studied to date as the "HPCs" in this letter. If you have any suggestions for the candidate pool, please send them along.

Constellation Software Inc. ("CSI") is just entering its third decade. We study the HPCs because they help us understand what CSI does well, where we might improve, and what alternatives we could pursue. Keep in mind that we are comparing CSI to a group of wonderful companies. Over the last decade, if you had held an equally weighted portfolio of the shares of the HPCs, you would have more than doubled the performance of the S&P 500.

We reviewed one of our perennial favourite HPCs this quarter, Jack Henry and Associates, Inc. ("JKHY"). The company's values are those to which we aspire and their multi-decade performance is remarkable. Their shares have outperformed the S&P 500 Index by 11%, 9% and 10% per annum over the last 30, 20 and 10 years, respectively. Best of all, JKHY is in the vertical market software business like CSI, so there are sector-specific lessons in their history from which we can draw.

I encourage you to familiarise yourself with JKHY. Their financial history is easily accessible because they went public very early in their development (i.e. in late 1985). At that time they had less than 50 employees and revenue of \$12 million. They now have over 6,000 employees and revenue of \$1.3 billion. There's also a lovely company history "[You Don't Know Jack... or Jerry](#)", written by a retired IBM executive. The book covers JKHY's founding years through to the end of 2007. It provides many first-hand accounts by employees, customers, competitors and partners about the business practices, strategy, and culture of the company.

During the course of this letter I've incorporated our findings from the HPCs in general and JKHY in particular to the discussion of each metric.

One point of caution with respect to the HPC analysis. The individual HPCs have differences in how they have compiled their publicly available financial information and our calculations of their financial metrics may not be entirely consistent across the group. Despite these "data challenges" we believe the analysis is worthwhile and can provide some insights.

### **Adjusted Net Income**

Table 1 contains the non-IFRS metrics for CSI which we present each year. The definitions for these metrics appear in the Glossary at the end of this document. Any other capitalised financial terms in this letter are also defined in the Glossary. Unless otherwise indicated, all dollar amounts are expressed in millions of U.S. dollars. Several of the statements in this letter constitute forward looking statements and should not be read as guarantees of future results. See "Forward Looking Statements".

CSI's Adjusted Net Income ("ANI", column 2 of Table 1) increased by 35% to \$371 million in 2015. Our average annual increase in ANI per share over the last decade has been 37%. We do not expect to come close to achieving this ANI growth rate in the next decade.

During the last decade, the HPCs struggled to increase their ANI per share by more than 15% per annum. JKHY's annualised growth in ANI was only 12% over that period. This drove much higher appreciation

in JKHY's shareholder value because they also made significant dividend payments and share repurchases (jointly averaging 10% of Average Invested Capital per annum). If CSI is not successful in finding attractive acquisitions, we could pursue a similar strategy of returning capital to shareholders.

Table 1

	Adjusted Net Income (a)	Average Invested Capital	ROIC	Organic Net Revenue Growth (YoY)	ROIC + Organic Net Revenue Growth
2006	26	123	21%	8%	29%
2007	33	154	22%	1%	23%
2008	54	195	28%	5%	33%
2009	62	256	24%	-3%	21%
2010	84	325	26%	-2%	24%
2011	140	394	36%	7%	43%
2012	172	491	35%	2%	37%
2013	207	585	35%	4%	39%
2014	274	739	37%	3%	40%
2015	371	965	38%	-3%	35%

(a) Historical figures restated to comply with revised definition.

Only a couple of HPCs that have employed significant financial leverage have had ANI/Share growth consistently in excess of 15%. Inexpensive financial leverage is a tool that diversified conglomerates can easily access. We haven't decided yet where we stand on using leverage, other than that we want to avoid using short term debt to finance long term assets, or using long term debt that is unreliable.

### **Invested Capital**

CSI's Average Invested Capital (column 3, Table 1) increased by 31% in 2015 to \$965 million. By December 31<sup>st</sup> of that year, Invested Capital topped one billion dollars. There's nothing magical about the billion dollar amount, but it is a bit sobering to note that we took over seventeen years to invest the first half billion of CSI's capital. The remaining half billion has been invested during the last three years. We are continuing to add to our "investment capacity". Despite that, we expect the rate of growth in capital deployment to slow.

About eighteen months ago we looked at the impact of investment hold period on transaction costs. We had some rules of thumb in mind, but hadn't actually done the math. If you hold investments forever, you can afford to spend a surprising amount of money to deploy capital at attractive returns. I have been encouraging our Operating Groups to push down more of the acquisition activity to the Business Unit ("BU") level, even if it means higher capital deployment costs. If we can train a couple of hundred BU managers to be competent part-time capital allocators and provide them with acquisition analysis and structuring support when they need it, then I can foresee the day when we are doing 100 acquisitions per annum, instead of 30. It makes the BU manager's job richer and more fun, but also more demanding.

Only one other HPC has followed a strategy of buying hundreds of small businesses and managing them autonomously. They eventually caved in to increased centralisation. My hunch is that it takes an unusually trusting culture and a long investment horizon to support a multitude of small businesses and their entrepreneurial leaders. If trust falters the BU's can be choked by bureaucracy. If short term results are paramount, the siren song of consolidation synergies is powerful. We continue to believe that autonomy and responsibility attract and motivate the best managers and employees.

We are currently adding several hundred million to Invested Capital each year. In addition to our traditional M&A activity, we are re-starting our public company investing efforts. During the period

from 1995 to 2011, we made sixteen public company investments in the software sector. If you viewed our public company investments as a single portfolio, the internal rate of return ("IRR") for that portfolio far exceeded our hurdle rate. Thirteen of the sixteen investments generated individual IRRs in excess of 10%, and only one small investment had a negative rate of return. The average hold period was shorter than we would have liked, and most of the investments ended in the companies being acquired by third parties, rather than CSI. Those may prove to be the fundamental limitations for this sort of investment activity. We hope to find some attractive public software company investments in the coming year or two. At present, the pickings are slim due to generally high valuations.

### **Return on Invested Capital**

ROIC is the next metric in the table, but I thought it was worth a long segue to discuss what we found at the HPCs when we studied a closely related metric, EBITA/Average Total Capital ("EBITA Return"). Both metrics look at return on investment. ROIC is the return on the shareholders' investment and EBITA Return is the return on all capital. In the former, financial leverage plays a role. In the latter only the operating efficiency with which all net assets are used is reflected, irrespective of whether those assets are financed with debt or shareholders' investment.

Surprisingly the HPCs seem to have a fairly consistent pattern of EBITA Returns. Most of them started out in an asset-light business. A few didn't have the "asset-light epiphany" until after they'd struggled with more capital intensive businesses for a few years. During the first year of data that we were able to source for each HPC, they averaged a respectable 21% EBITA Return. Subsequently their returns experienced a period of dramatic improvement as they refined their operating methods and philosophies. These operating methods varied, but generally involved techniques for the detailed measurement of business processes coupled with relentless incremental improvement. At some of the HPCs the methods are applied with a zeal that makes me a bit uncomfortable. It's hard to argue with results. The average peak EBITA Return for the HPCs was 46%, and on average it took them 6 years from the start of our measurement period to achieve those peak returns.

At peak returns, the HPCs' cash flows far exceeded their internal requirements, so all of them embarked upon acquisition programs. They acquired businesses similar to their own - i.e. asset light business with good barriers to entry and a history of positive organic growth. They paid significant premiums to book value for the acquisitions. The initial EBITA Return in each of the acquired businesses would have been modest because of the high purchase prices, but organic growth required little investment in tangible assets so returns would have subsequently climbed. In many instances the acquired businesses were not run optimally prior to acquisition, and the HPCs were able to apply their business practices to further improve returns.

The HPCs have invested almost their entire Free Cash Flow ("FCF") in acquisitions during the last decade. This has allowed them to grow Revenue per share and ANI per share at an average of 9% and 17% per annum, respectively, over the same period. However, their significant acquisition expenditures have tended to depress EBITA Returns. 2015 EBITA Return averaged only 18% for the group.

JKHY's EBITA Return for the last decade was 24%. They performed better than the other HPCs on this metric because they had strong organic growth and did not invest as much of their FCF in acquisitions.

We haven't confirmed it yet by compiling the detailed data, but I have a feeling that acquisition multiples, acquisition size and acquisition profitability have all increased over time for the HPCs. In CSI's case, I've confirmed the first two, but need to check the third.

In summary, the general pattern for the HPCs' EBITA Returns for the study period has been moderate, high and then declining returns, with operating excellence driving the period of growth and significant investments in relatively high priced acquisitions driving the subsequent period of contraction. If CSI's

EBITA Return pattern is similar, there's a good argument that our 37% EBITA Return in 2015 was close to the peak, and that acquisitions will drive it lower from here on out.

CSI's ROIC (column 4 Table 1) was 38% in 2015, its highest to date. Viewed over the long term, our ROIC has increased fairly consistently due to improving EBITA/revenue margins and increasing but still moderate financial leverage. Our acquisition mix in 2015 was also unusual. We acquired some large, high margin but shrinking businesses with attractive tax characteristics and higher than normal profitability resulting in consolidated EBITA/revenue margin reaching record levels.

Most of the HPCs have operated with ROIC's in the mid to high teens during the last decade. JKHY was in the middle of the ROIC range at 18%. CSI was the second highest in the group, with a 30% ROIC average for the decade. I anticipate that we will deploy larger amounts of capital on investments each year. We are using a lower hurdle rate for larger transactions, but have retained our original hurdles for most of our acquisitions. Unless we use increasing amounts of financial leverage, increased acquisition investment and lower hurdle rates on large transaction will likely drive down our future ROIC. Interestingly, half of the HPCs have begun to acquire vertical market software businesses.

Financial leverage is a tool that can have a profound impact on ROIC. Some HPCs have whittled down Invested Capital as a percent of Total Capital by borrowing to pay dividends, repurchase shares, and/or make acquisitions. This has helped them generate higher ROIC's. One of the HPCs has returned their entire Invested Capital to shareholders, and hence generates an infinite ROIC. If covenant-free long-tenured debt is available at a lower after tax cost than equity, then this kind of capital structure is attractive.

### **Organic Net Revenue Growth**

CSI's Organic Net Revenue Growth ("OGr", column 5, Table 1) was negative in 2015 for the first time since the last recession. The Maintenance analysis in Table 3 below, shows that much of the decline vs 2014 was due to shifts in foreign exchange rates. Nevertheless, when we compare CSI's organic revenue growth to that of the other HPCs, we rank amongst the poorest performers and JKHY ranks amongst the best. Are we doing something systematic that leads to low OGr, and if so, is it a mistake? It is worth comparing JKHY and CSI to get some ideas.

JKHY sells software, hardware and services to small and medium sized financial institutions. The number of potential customers in these markets has been shrinking for decades. In the early years, JKHY acquired a number of competitors for reasonable prices, which reduced some of the rivalry in their market, and gave them a larger installed base for which to develop add-on products.

Significant technology change (ATM's, internet banking, mobile banking, and proliferating electronic payment methods) in conjunction with rapidly growing regulation and compliance requirements, drove demand for add-on products and services. During the 2005 to 2015 decade, JKHY's revenue growth has been 2/3<sup>rd</sup>s organic and 1/3<sup>rd</sup> acquired, with acquisitions primarily being add-on products and services businesses. JKHY deployed approximately one third of their FCF on acquisitions during the decade.

Unlike JKHY, CSI serves a multitude of end markets. We deployed far more (>90%) of our FCF on acquisitions during the last decade. As of December 31, 2015 we had 182 BUs serving more than 75 verticals, run by 158 BU managers that rolled up into CSI via 6 Operating Groups. We usually organise each BU around a single vertical, although there are a few of our BUs that serve more than one vertical, and a many verticals served by more than one of our BUs.

The variations between each of our vertical markets is enormous. Some markets are consolidating, some not. In some we have high market share, in others we are a niche player. Some markets have compliance and technology drivers, while others rarely change their systems. Some have rapidly churning clients while others have long-lived clients. Some clients spend their own money buying systems, and some are

spending an employer's. Some buy enterprise-wide systems with significant customisation, while others buy departmental SaaS products with no customisation. Some markets have rabid venture-backed competitors with a grow-at-any-cost ethos, while others have a few rational competitors intent on making a decent living. All of these factors impact the organic growth potential of our businesses. Taking the particular industry and company factors into account, our BU managers work to develop an appropriate strategy.

A number of our businesses have strategies similar to JKHY i.e. they have built high market share in core systems via acquisition and organic growth, after which they've purchased and built add-on products to serve their clients better and drive up switching costs. JKHY appears to be willing to pay high prices for some third party add-on product businesses that might sell well into their installed base. We have tended to be more sceptical of such cross-selling synergies, perhaps because the investment decision-making has not historically been at the BU manager level. A lesson from JKHY, is that we may have been overly cautious regarding cross selling synergies.

In a variation on the "industry leader rollup with broad suite of add-ons" strategy, we sometimes acquire a group of businesses in the same market and run them independently. This can lead to duplication of costs but also tends to make for better market coverage, differentiated products and ultimately, higher market share. We have developed some add-on products to share between these BUs and sometimes share administration expenses, but the BU managers are autonomous, compete vigorously with each other, and are held accountable only for their own results. Operating with this kind of strategy, we may not be as likely to buy high growth add-on product businesses, nor invest as heavily in developing add-on products, because each BU Manager can't justify the investment based solely on his BU's installed base.

In some verticals, we are not the #1 or #2 player. There are a couple of strategies that we follow in this instance. We obviously try to use our knowledge of the vertical to acquire our way to a leadership position. That sometimes works (e.g. paratransit, mid-tier utilities, equipment rental software, homebuilding software, agricultural software, public housing software). If we are a small market share player and are unable to grow share via acquisition, we target a defensible niche within the overall market where we can differentiate our offering to compete effectively. Sometimes we can grow that niche, sometimes not. In some markets, it may not be economic to compete for new name clients. In that case, your niche has to be the clients that you already have. You target your service, support and add-on products solely at that base, and if the underlying attrition of the industry that you are serving is low, this can be a very good business model.

All of these strategies work, albeit with very different organic growth outcomes. We have tracked the IRR for all of the acquisitions that we've made since 2004 (i.e. >95% of the acquisition capital that we've deployed). When we graph the IRR's vs the post-acquisition OGr of each investment, there is little correlation. If you are really striving to see a relationship, you might argue that our best and our worst IRR's are both associated with low post-acquisition organic growth. Based on the data, there are much more obvious drivers of IRR than OGr. For instance, Revenue multiple paid (lower purchase price multiples are better - no revelation there), and post-acquisition EBITA margin (fatter margin acquisitions tend to generate better IRR's – somewhat intuitive, but needs further work).

How about a thought experiment? Assume attractive return opportunities are scarce and that you are an excellent forecaster. For the same price you can purchase a high profit declining revenue business or a lower profit growing business, both of which you forecast to generate the same attractive after tax IRR. Which would you rather buy?

It's easy to go down the pro and con rabbit hole of the false dichotomy. The answer we've settled on (though the debate still rages), is that you make both kinds of investments. The scarcity of attractive return opportunities trumps all other criteria. We care about IRR, irrespective of whether it is associated with high or low organic growth.

Organic growth can be associated with good IRR's. There are obvious techniques to improve IRR: You keep the early burn rate down while you test the major assumptions and then you add fuel to the fire once the risk associated with the low probability hypothesis testing is largely behind you. You try to test as cheaply as possible, and you move on quickly to new hypotheses. My background is in the venture industry, and that sort of hypothesis testing was what I did for eleven years. Most of our key managers earned their chops running strong organic growth verticals before building out their Operating Groups, so they're used to investing for organic growth. I don't think any of us had done an acquisition before we came to CSI. The vast majority of the CSI senior management team has a natural bias towards organic growth. But despite that bias, we strive to be rational, and only embark on Initiatives (and acquisitions) that we believe will meet our hurdle rate on a probability weighted basis.

Obviously we could do more organic growth Initiatives (and acquisitions) if we dropped our hurdle rates. We observed in early 2015, however, that lowering hurdle rates had historically been far more expensive than we originally thought. We analysed the weighted average expected IRR's for each of our acquisitions by year from 1995 to early 2015 and compared them with the prevailing hurdle rate we were using when the acquisitions were made. During that twenty year period we made three changes to the hurdle rate, one up, two down. The weighted average expected IRR for each vintage (e.g. all of the acquisitions done in 2004) of acquisitions tended to drop or increase to the newly implemented hurdle rate. Said another way, when we dropped our hurdle rate, it dragged down the expected IRR's for all the opportunities that we subsequently pursued, not just those at the margin. We try to capture this idea by saying "hurdle rates are magnetic". It now takes a very brave soul to propose a hurdle rate drop at CSI.

Only our BU managers have the intimate knowledge of their markets and teams needed to intelligently trade-off short term profitability and long term growth when they choose to sponsor an Initiative. Only they can deliver the "synergies" required to justify the acquisition of a high growth potential add-on products/services company. So if we are going to delegate the responsibility for organic growth and some of the acquisitions to the BU managers, how do we go about attracting and keeping great BU managers? I encourage you to bring up the question with our Operating Group managers at the annual general meeting ("AGM").

Our best BU managers have overseen double digit rates of growth for years via a combination of organic growth and acquisitions in their vertical and in adjacencies. That kind of low capital intensity compound growth creates powerful economics that generate remarkable incentive compensation. For BU managers that are new to the job and running a single BU, the compounding effect isn't as obvious, so we've started to roll out an additional bonus program targeted at keeping this contingent around until their wealth building potential becomes apparent. To date there are over 100 CSI employee/shareholder millionaires. Ten years from now, my hope is that there will be five times as many.

Table 2

	Quarter Ended								Fiscal Year Ended	
	Mar. 31	Jun. 30	Sep. 30	Dec. 31	Mar. 31	Jun. 30	Sep. 30	Dec. 31	Dec. 31	Dec. 31
	<u>2014</u>	<u>2014</u>	<u>2014</u>	<u>2014</u>	<u>2015</u>	<u>2015</u>	<u>2015</u>	<u>2015</u>	<u>2014</u>	<u>2015</u>
CSI Method	7%	5%	4%	0%	-2%	-4%	-5%	-1%	4%	-3%
Alternate Method	6%	4%	5%	2%	-2%	-4%	-4%	-1%	4%	-3%

As a wrap up to the organic growth discussion, Jamal, at the urging of one of the analysts who covers CSI, asked me to compare how we calculate organic growth in revenue in our quarterly Management's Discussion and Analysis ("MD&A") to a commonly used alternative method. In the MD&A we estimate the run-rate revenue of the acquired businesses at the time of their acquisition as the starting point for

subsequent organic growth measurements. The common alternative method excludes the revenue of the acquired businesses from the calculation of organic revenue growth until the first anniversary of each acquisition. In Table 2 above, we've calculated organic revenue growth for the last eight quarters using both methods. The results are very similar. There are advantages and disadvantages to each method, but we'll continue to use our historical method in the MD&A, since it more quickly reflects organic growth changes caused by acquired businesses.

### **Combined Ratio**

The final column in Table 1 is our "Combined Ratio" i.e. the sum of ROIC and OGr. We have touted the Combined Ratio as the best single measure of CSI's performance. CSI's ROIC+OGr was 35% in 2015, down significantly versus the levels achieved in the years since the last recession.

One of the problems with growing asset-lite businesses is that the historical Invested Capital required to purchase the business becomes increasingly irrelevant over time. We have a number of businesses where their current EBITA now exceeds their original purchase price. If they have achieved all of that growth organically, they have likely also reduced working capital significantly, perhaps driving the net purchase price below zero, and hence ROIC to infinity. These sorts of businesses defy conventional financial statement measurement, which is why we use IRR to track performance. Even IRR has its faults, usually to do with re-investment assumptions and the fact that it indicates neither hold period nor the amount of the investment. These faults are illustrated well by the impressive but largely unimportant IRR track record of our previous public company investments.

Since ROIC is also one of the big drivers of our incentive compensation program, we care about this "increasingly high ROIC" issue. When ROIC is very high, bonuses start to consume a disproportionate and inappropriate amount of pre-bonus net income. We've actually run into this situation a couple of times. You can either change the plan, cap the bonuses, or ask the managers to keep their profits and redeploy them in acquisitions or Initiatives.

We dislike changing bonus plans because it literally takes years for trust to re-build to the point where managers are willing to trade off short term profitability and bonus for higher longer term profitability. We saw this in spades when our major investors put CSI up for sale in 2011. ROIC increased sharply, acquisitions slowed dramatically, and Initiative spending dropped. Faced with the prospect of new owners intent on changing the bonus program and borrowing mountains of debt to acquire the business, our managers reacted as you'd expect, maximising short term profitability and bonuses at the cost of longer term growth and profitability.

The second alternative is capping bonuses. This feels like an extremely strong incentive to shift revenue and profit between good and bad years. It also undermines the utility of the accounting and information systems as management tools. Good people who might stray, become bad people in tiny steps greased by "everyone is doing it" and "it was a grey area". The last thing you want to do is build an incentive system that pushes employees out onto that slippery slope. We aren't fans of capped bonuses.

The third alternative shifts the capital allocation task down to the Operating Groups and Business Units. If they are producing handsome returns, they also need to figure out how to redeploy some of that capital. If they aren't producing good returns, we are happy for them to send excess capital back to head office. Since the Operating Groups and BUs "own" the bulk of our human resources, they also have the talent to develop opportunities and manage them (whether those opportunities are acquisitions or Initiatives). This is the alternative we've opted for when ROIC's get very high.

In the past, we've had both the Volaris and Vela Operating Groups on the "you've got to keep your capital" program, and they've responded well by deploying it at attractive rates of return. One of the nice

side effects of the “keep your capital” restriction, is that while it usually drives down ROIC, it generates higher growth, which is the other factor in the bonus formula. Acquisitions also tend to create an attractive increase in base salaries as the team ends up managing more people, capital, BUs, etc. Currently, a couple of our Operating Groups are generating very high returns without deploying much capital and we are getting to the point that we’ll ask them to keep their capital if they don’t close acceptable acquisitions or pursue acceptable Initiatives shortly. You might get some interesting dialog with the Operating Group managers at the AGM if you bring up this topic.

When we judge our own track record, we use IRR. We update the IRR forecasts for our acquisitions every quarter. The more “history”, and the less “forecast” that we have for each acquisition IRR, the better a measure it becomes of a manager’s investment performance. It takes years to figure out who are the great capital allocators. CSI’s shareholders do not have the IRR information, would question it if they did have it (by definition, it contains forecasts), and are unlikely to want to wade through the 245 acquisitions we’ve made since 2004 (to December 31, 2015). Divulging the information would arm our competitors with acquisition pricing information so that they can bid against us more effectively, and acquisition performance data so that they can compete with us in our most attractive markets. So providing IRR information isn’t the right way to keep shareholders informed.

Years ago, we settled on the Combined Ratio as a proxy for the growth in intrinsic value. If you assume that we continue to invest our entire FCF in acquisitions, and that the economics of our acquisitions are similar to those that we’ve demonstrated over the years, then ROIC+OGr is a reasonable (but somewhat overstated) proxy for the increase in intrinsic value. However, if we start paying higher multiples for acquisitions or using significant amounts of debt to either make more acquisitions, buy back shares and/or pay dividends, then the Combined Ratio metric can quickly become misleading. We’re starting to look around for a better single metric to reflect the growth in intrinsic value.

### **Maintenance Growth and Attrition**

The Maintenance growth and attrition statistics appear in Table 3. We have removed the estimated impact of foreign exchange from the “Price Increases and Other” category. FX was a big number this year, driving down our Maintenance growth by 6%. Total organic growth in Maintenance revenue was 7% in 2015, down slightly from last year. Lost module attrition is back down to its historical levels after an acquisition related increase last year. Acquisitions provided the bulk of the growth in 2015.

One of the concerns with acquisitive companies is that some of them grow revenues and adjusted earnings but impair the underlying value of their intangible assets. In essence what purports to be a return on capital is really a return of capital. We present these Maintenance statistics each year so that you can see if the Maintenance base is growing or shrinking organically. Our thesis is that as long as the base is growing organically, the value of the business is growing and our shareholders are getting a return on capital, not of capital. The 2015 numbers continue to support the thesis, albeit muddied by the estimated FX numbers.

As we caution you each year with regard to this table, while the totals are materially the same as our Maintenance revenue for financial reporting purposes, the individual components reflected in the table are generated by examining and categorising tens of thousands of records. The estimated FX adjustment was calculated by translating the Maintenance amounts in major foreign currencies into U.S. dollars at the average FX rates for each year. We believe that the data presented is a fair illustration of the trends in our Maintenance base.

Table 3

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Maintenance Revenue (US\$MM)</b>	<b>116</b>	<b>142</b>	<b>193</b>	<b>252</b>	<b>337</b>	<b>417</b>	<b>510</b>	<b>725</b>	<b>1,015</b>	<b>1,170</b>
<b>Growth from:</b>										
Acquisitions	17%	11%	25%	27%	25%	15%	15%	34%	32%	15%
Organic Sources										
a) New Maintenance	15%	9%	9%	8%	8%	8%	8%	10%	10%	8%
b) Price Increases and other	5%	9%	9%	4%	6%	5%	5%	6%	7%	5%
c) Attrition - Lost Modules	-2%	-2%	-3%	-3%	-3%	-2%	-2%	-2%	-4%	-2%
d) Attrition - Lost Customers	-4%	-4%	-4%	-4%	-4%	-3%	-4%	-5%	-5%	-5%
Total Organic Growth*	14%	12%	10%	4%	7%	7%	8%	8%	8%	7%
Estimated effect of FX	0%	0%	0%	-1%	1%	2%	-1%	-1%	-1%	-6%
Total Maintenance Growth *	31%	23%	35%	31%	34%	24%	22%	42%	40%	15%

\* Certain totals may not reconcile due to rounding

### Revenue per Share

Table 4 contains a couple of IFRS/GAAP metrics that we think are useful for our investors. Revenue growth is an upper-bound setter, since the growth rate of net income, ANI, cash flow from operating activities and dividends are all ultimately going to be limited by the revenue growth rate.

Table 4

	Total Revenue per Share	YoY $\Delta$	Cash Flow from Operating Activities per Share	YoY $\Delta$
2006	10.01	23%	1.36	12%
2007	11.47	15%	1.62	19%
2008	15.60	36%	2.96	83%
2009	20.67	32%	3.85	30%
2010	29.92	45%	5.06	32%
2011	36.49	22%	6.49	28%
2012	42.05	15%	6.83	5%
2013	57.13	36%	10.40	52%
2014	78.77	38%	16.11	55%
2015	86.75	10%	18.68	16%
CAGR		27%		31%

In 2015 CSI's revenue per share increased 10%. This was our worst performance since 2002.

The HPCs averaged 9% per annum revenue per share growth over the last decade. JKHY averaged 10%.

Absent enough attractive opportunities to deploy capital, I would not be hugely disappointed with a 10% annual increase in CSI's revenue per share over the next five years, so long as we also started paying significant dividends. We will obviously try to do better, and have refinanced our revolving line of credit and raised incremental debentures to put ourselves into a position where we are not capital constrained if we find acquisitions that meet our hurdle rate.

### Cash Flow from Operating Activities per Share

CSI's cash flow from operating activities ("CFOA", column 4, Table 4) per share increased 16% in 2015. Note that CFOA is a defined term under IFRS and is shown in this table, as it is in our financial statements for 2010 and beyond, before the deduction of interest paid. CSI's CFOA per share will eventually be limited by our growth in revenue per share.

Last year I suggested that CFOA less interest paid (for 2010 and subsequent years) and capital expenditures all calculated on a per share basis was a good way to look at CSI's results. That's a non-IFRS metric, so all the associated warnings apply.

### Great Companies Are Not Always Great Stocks

There's one last lesson from JKHY that I'd like to share. It relates to you as shareholders. There was a ten year period during which JKHY's shares both underperformed the S&P 500 (2000 until 2010) and didn't make any money for shareholders. The underperformance vs the S&P 500 was minor ... approximately 1%. JKHY's revenues per share and ANI per share had compound average annual growth rates of 14% and 21%, respectively during that decade. Why did stock results and operating results diverge so widely for such a long period? It had to do with shareholder expectations and market exuberance. The general mania which gripped the market in 2000, and the more specific enthusiasm for JKHY's stock which then traded at well over 60 times ANI, left shareholders incredibly vulnerable. When the market "corrected" the JKHY stock had no margin of safety.

When really good companies start trading at 5 and 6 times revenues, it's time to start worrying. I hope our shareholders are never in that position.

### Partners

In last year's letter I explained that the directors and I had worked out a plan where I was to work less and get paid less. After more than a year under that regime, I'm not complaining, and the directors don't seem uncomfortable.

More important, our shareholders seem comfortable with my new "partner not employee" arrangement. I was pleased to see that this year's AGM proxies still overwhelmingly voted for both our inside and outside directors.

I'd like to thank our shareholders and our employees for their continued support.

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I sometimes recommend books. I don't do this lightly, as I know they can be an obligation (sometimes felt heavily) to spend precious time. I feel better when I remember Will Rogers' advice about learning by reading'.

The books that I recommended in previous letters were summaries of seminal scientific research. This year I'd like to propose that you read "*One Man's Medicine: An Autobiography of Professor Archie Cochrane*", and "*Effectiveness and Efficiency, Random Reflections on Health Services*", both by A. L. Cochrane. I'm sneaking in two books because they are both thin. Once again the books contain summaries of scientific research, this time in epidemiology.

The first book is a moving, idiosyncratic and dryly amusing autobiography of a brilliant and erudite outsider that makes you wish you'd known the man firsthand.

The second is a stinging critique of a well-meaning but entrenched medical establishment, for their ineffective and dangerous medical practices.

While the epidemiology is interesting and surprisingly relevant even today (people change incredibly slowly!), Archie's observations regarding medical practices and doctors struck me as applying equally to business practices and managers. The asymmetric effectiveness of most medical treatments, rarely influencing positive outcomes while frequently contributing to negative ones, made me think critically about what I and most other managers do.

Archie's legacy is a worldwide volunteer organisation (Cochrane.org) consisting of 37,000 contributors in 130 countries producing systematic reviews of medical research so that researchers, doctors, and patients have access to the most recent evidence from randomised controlled trials "RCTs" to make healthcare decisions.

The progress in business knowledge is painfully slow and is fraught with guru's generalising from plausible anecdotes. A little more experimentation (in the old sense of the word, i.e. testing hypotheses) would go a long way towards improving business practices.

At CSI we spend time on non-randomised observational studies (the red haired step-child of RCTs) trying to spot business practices that actually add value rather than overhead. One of our analysts recently looked at the correlation of increased customer spending with a host of factors and found a single significant correlation. That finding may be an aberration, or it may be a way to unlock untapped organic growth. While I was interested in the analysis, I was incredibly proud of the people involved. Without questioning minds and willing participants providing data, you can't even start to solve the important questions.

We will be hosting the AGM on Thursday, April 28<sup>th</sup>. Many of our Directors and Officers and a number of our employee shareholders will be in attendance. We look forward to talking about our business and answering your questions. We hope to see you there.

Mark Leonard April 26<sup>th</sup>, 2016  
President  
Constellation Software Inc.

## Glossary

For 2009 and prior periods, the financial information for CSI was derived from the consolidated financial statements which were prepared in accordance with Canadian generally accepted accounting principles (“GAAP”). 2010 and subsequent year financial information for the Company was derived from the consolidated financial statements which were prepared in accordance with International Financial Reporting Standards (“IFRS”). Certain totals, subtotals and percentages may not reconcile due to rounding.

“Adjusted net income” effective Q1 2008, means adjusting GAAP or IFRS net income for non-cash expenses (income) such as amortization of intangible assets, deferred income taxes, the TSS membership liability revaluation charge, and certain other expenses (income), and excludes the portion of the adjusted net income of Total Specific Solutions (TSS) B.V. (“TSS”) attributable to the minority owners of TSS. Prior to Q1 2008, Adjusted net income was derived by adjusting GAAP net income for the non-cash amortization of intangibles and charges related to appreciation in common shares eligible for redemption. The calculation was changed to include future income taxes since the majority of future income taxes relate to the amortization of intangible assets, and thus are added back to more closely match the non-cash future tax recovery with the amortization of intangibles. All previously reported Adjusted net income figures have been restated in the table above to reflect the new calculation method. The Company believes that Adjusted net income is useful supplemental information as it provides an indication of the results generated by the Company’s main business activities prior to taking into consideration amortization of intangible assets, deferred income taxes, the TSS membership liability revaluation charge, and certain other non-cash expenses (income) incurred or recognized by the Company from time to time, and adjusts for the portion of TSS’ Adjusted net income not attributable to shareholders of CSI.

“Average Invested Capital” represents the average equity capital of the Company, and is based on the Company’s estimate of the amount of money that its common shareholders had invested in CSI. Subsequent to that estimate, each period the Company has kept a running tally, adding Adjusted net income, subtracting any dividends, adding any amounts related to share issuances and making some minor adjustments, including adjustments relating to our use of certain incentive programs and the amortization of impaired intangibles. The Company believes that Average Invested Capital is a useful measure as it approximates the retained earnings of the Company prior to taking into consideration amortization of intangible assets, deferred income taxes, and certain other non-cash expenses (income) incurred or recognized by the Company from time to time. ROIC” means Return on Invested Capital and represents a ratio of Adjusted net income to Average Invested Capital. The Company believes this is a useful profitability measure as it excludes non-cash expenses (income) from both the numerator and denominator.

“Net Revenue”. Net Revenue is gross revenue for GAAP or IFRS purposes less any third party and flow-through expenses. The Company believes Net Revenue is a useful measure since it captures 100% of the license, Maintenance and services revenues associated with CSI’s own products, and only the margin on the lower value-added revenues such as commodity hardware or third party software.

“Total Capital” is the sum of Net debt plus Invested Capital

“Net Debt” is debt less cash.

“Free Cash Flow” in this letter, unlike under IFRS is cash flow from operating activities less interest paid and property and equipment purchased.

“EBITA” is earnings before interest, taxes and the amortisation of intangible assets.

“EBITA Return” is EBITA/Total Capital

“HPCs”: Ametek, Danaher, Dover, Illinois Tool Works, Roper, Jack Henry & Associates, Transdigm, and United Technologies.

As part of this letter, we have compared CSI with the HPCs using many commonly used financial metrics. The financial metrics principally used to compare CSI with the HPCs are: adjusted net income (ANI), earnings before interest, taxes and amortization (EBITA), return on invested capital (ROIC), Total Capital, Net Debt, EBITA Return, and Free Cash Flow. We have had to rely on publically available information in order to calculate the financial metrics for the HPCs. It should also be noted that there will be differences between how the financial metrics are calculated for CSI and each of the HPCs.

### Forward Looking Statements

Certain statements in this letter may contain “forward looking” statements that involve risks, uncertainties and other factors that may cause the actual results, performance or achievements of the Company or industry to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. Words such as “may”, “will”, “expect”, “believe”, “plan”, “intend”, “should”, “anticipate” and other similar terminology are intended to identify forward looking statements. These statements reflect current assumptions and expectations regarding future events and operating performance as of the date of this letter. Forward looking statements involve significant risks and uncertainties, should not be read as guarantees of future performance or results, and will not necessarily be accurate indications of whether or not such results will be achieved. A number of factors could cause actual results to vary significantly from the results discussed in the forward looking statements. Although the forward looking statements contained in this letter are based upon what management of the Company believes are reasonable assumptions, the Company cannot assure investors that actual results will be consistent with these forward looking statements. These forward looking statements are made as of the date of this letter and the Company assumes no obligation, except as required by law, to update any forward looking statements to reflect new events or circumstances. This report should be viewed in conjunction with the Company’s other publicly available filings, copies of which can be obtained electronically on SEDAR at [www.sedar.com](http://www.sedar.com).

### Non-GAAP/IFRS Measures

Adjusted net income and Organic Net Revenue Growth are not recognized measures under GAAP or IFRS and, accordingly, shareholders are cautioned that Adjusted net income and Organic Net Revenue Growth should not be construed as alternatives to net income determined in accordance with GAAP or IFRS as an indicator of the financial performance of the Company or as a measure of the Company’s liquidity and cash flows. The Company’s method of calculating Adjusted net income and Organic Net Revenue Growth may differ from other issuers and, accordingly, may not be comparable to similar measures presented by other issuers. Please refer to CSI’s most recently filed Management’s Discussion and Analysis for reconciliation, where applicable, between the IFRS, GAAP and non-GAAP/IFRS measures referred to above.

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“optimism is highly valued, socially and in the market; people and firms reward the providers of dangerously misleading information more than they reward truth tellers” Daniel Kahneman

“What accounts for TIT FOR TAT’s robust success is its combination of being nice, retaliatory, forgiving, and clear.” Robert Axelrod

“I ended up writing the book... between the hours of 10:00 pm and 1:00 am when I had finished everything else. I date the real beginnings of my love of whiskey to this period.” Archie Cochrane

“There are three kinds of men. The ones that learn by readin’. The few who learn by observation. The rest of them have to pee on the electric fence for themselves.” Will Rogers