

PERFORMANCE METRICS IN AN INCREASINGLY SaaS-BASED WORLD

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CONTENTS

- EXECUTIVE SUMMARY 3
- HIGHLIGHTS OF THE STUDY 4
- SECTION 1 6
 - PERFORMANCE METRICS IN AN INCREASINGLY SAAS-BASED WORLD 6
 - THE PURPOSE OF THIS WHITE PAPER 6
 - WHAT IS A SaaS-BASED BUSINESS? 7
 - EXAMPLES OF COMMON SaaS ORGANIZATIONS 9
 - WHAT MAKES SaaS DIFFERENT? 9
 - THE STUDY'S PARTICIPANTS 11
- SECTION 2 13
 - LESSONS FROM THE FIELD 13
- SECTION 3 26
 - PARTICIPANT INSIGHTS 26
- SECTION 4 30
 - PERSPECTIVE 1: INSTITUTIONAL PURCHASERS OF SaaS PRODUCTS 30
 - PERSPECTIVE 2: INVESTORS 32
 - PERSPECTIVE 3: ACCELERATORS/INCUBATORS 34
- SECTION 5 36
 - SUMMARY AND RECOMMENDATIONS 36
- APPENDICES 39
 - APPENDIX A - THE STUDY'S METHODOLOGY 39
 - APPENDIX B - AN ILLUSTRATIVE EXAMPLE OF INTEGRATED METRICS 40
 - APPENDIX C - SAAS READING REFERENCES 41
- BIBLIOGRAPHY 44
- ABOUT THE AUTHORS 46
- ACKNOWLEDGMENTS 47

EXECUTIVE SUMMARY

A primary goal of the CPA Ontario Performance Management Research and Education (CPMRE) White Paper series is to provide thought leadership on performance management topics of broad interest to members of the business community in Ontario and beyond. This paper explores the emergence of **Software as a Service (SaaS)** business models that are growing at an exponential rate both in Canada and throughout the world. In particular, it examines the metrics that have evolved to guide and monitor the progress of SaaS enterprises.

CPA's who plan to work in SaaS-based businesses or who, in more traditional organizations, are faced with replacing legacy systems with SaaS-based products, quickly find that their backgrounds and training seldom prepare them for the different business models and performance metrics that are part of the cloud-based world.

This white paper addresses these gaps and specifically helps accounting and finance executives understand the differences between traditional and SaaS performance metrics. Readers will learn about the variations of SaaS business models and the principal performance metrics that guide them. They will hear from CEO and CFO's, many of whom are CPA trained, who, through interviews and round table discussions, have been willing to share their experiences and lessons learned in managing in an increasingly SaaS-based business environment. They will learn what key performance indicators investors look for when deciding to fund SaaS companies as well as the role played by academic institutions, accelerators and incubators in preparing individuals to understand both these new business models and the emerging performance metrics result from them.

Section 1 begins with an overview of the growing importance of subscription-based businesses, of which SaaS is a major component, the nature of the SaaS business model, examples of the many organizations competing in this rapidly growing digital space and the field-based methodology used to obtain information from a representative sample of SaaS organizations.

Section 2 provides responses obtained from key C-suite individuals (primarily with backgrounds in accounting and finance) on the following research questions.

- Question 1 - *What are the most important metrics tracked by the Board and senior management team in the organization?*
- Question 2 - *Are SaaS metrics used primarily for strategic or control purposes?*
- Question 3 - *What is the role of GAAP in the SaaS organization?*
- Question 4 - *Who is driving the adoption of SaaS-based metrics in the organization?*
- Question 5 - *What issues do SaaS companies face in collecting data to create robust performance metrics?*
- Question 6 - *What software packages are in use to support data collection and reporting?*
- Question 7 - *How are SaaS metrics used in assessing the company's valuation?*

Section 3 provides in-depth insight into the experiences encountered, and advice offered, by CPA's who have made the transition to the SaaS world. These personal accounts are valuable to any CPA who has recently transitioned into a SaaS company or who is contemplating making such a move.

Section 4 examines SaaS from alternative perspectives: (1) the SaaS purchaser - organizations that are increasingly acquiring SaaS products and services, (2) the SaaS investor - individuals and groups who are financing SaaS ventures and (3) the SaaS trainers - academic institutions, professional agencies and incubators/accelerators that are responsible for providing timely and SaaS-relevant information to future SaaS executives.

Section 5 concludes with recommendations directed mainly at those institutions that play a primary role in education, training and skills development for future SaaS financial professionals.

HIGHLIGHTS OF THE STUDY

The study revealed the following key findings:

- Software-as-a-Service (SaaS) and related subscription business models have grown rapidly in the last decade. World-wide spending on SaaS is estimated to reach \$100B by 2020, a growth rate of over 20% per year. It has been estimated that SaaS/subscription-based businesses are growing revenue at 5X the rate of the S&P 500 index.
- SaaS-based businesses pursue a different roadmap from more traditional manufacturing and retail organizations. Due to the “sunk cost” nature of the SaaS business model, the road to profitability is a long one and depends heavily on the ability of the SaaS enterprise to scale quickly.
- Traditional business metrics fail to capture the crucial factors that drive SaaS performance. The nature of the SaaS business model has motivated a different set of core metrics to analyse and manage the business.
- The five leading metrics used by SaaS organizations are ARR/MRR (Annual/Monthly Recurring Revenue), Customer Churn, CAC (Cost of Acquiring Customers), Sales Funnel traction and Cash Burn. These metrics are often decomposed into cohorts, geographies, contributions per employee and combined with other metrics such as LTV (Lifetime Value) to provide additional enterprise insights.
- SaaS metrics are used both for strategic and control purposes, however, the emphasis tilts more to provide insight into strategic concerns such as comparisons to other competitors, investment outlays and resource allocation decisions.
- GAAP accounting is viewed as a necessary regulatory requirement but is almost universally perceived as irrelevant for strategic, operational and investment considerations in SaaS organizations.
- For most early stage companies, SaaS metrics are usually driven by the founder. For later stage companies that have more sophisticated boards and Venture Capital investors, there is evidence of more Board engagement in determining and driving the use of SaaS metrics.
- CFO's are generally not the prime architects of metrics in SaaS-based businesses. However, they can, and must, play a lead role in ensuring the integrity of the data used to generate, report and analyze metrics.
- Data collection and data integrity are among the most critical issues facing SaaS companies. Manual processes, missing data in systems, and data consolidation are the top data related issues among the study's participants.
- Investors in SaaS companies indicate that valuations are typically based on a multiple of ARR, or that a multiple of ARR approach is used in tandem with other metrics currently collected by SaaS companies.
- It is critical that CFOs reach out to VC's and other sophisticated investors to better understand these stakeholders' needs and expectations.
- SaaS CFOs place heavy emphasis on the importance of taking time to understand the business, the key metrics that drive it, and recognizing that their responsibilities are often expected to go far beyond the finance/accounting function.
- Purchasers of SaaS products/services employ different criteria when determining whether to replace home grown/legacy IT systems with SaaS products. Strategically minded CFOs in SaaS companies need to recognize that their firm's value propositions must address purchasers' main concerns, which are: Will the SaaS product help us stay up to date? Will it help us address our tech talent shortage? Does it meet our standards for IRR (Internal rate of return) hurdle rate, security and privacy concerns, and can the SaaS provider offer the necessary support to assist in a global roll out.
- There is little content in formal education or in professional workshops that prepare prospective or current CPA/CFO's for their role in SaaS companies. There is, however, an extensive literature available on internet blogs, VC's and miscellaneous publications that CPA/CFOs can access quickly to raise their knowledge level of both SaaS models and SaaS metrics.
- There is agreement amongst participants that CFO's could add more value to businesses if they had exposure to SaaS models and metrics earlier in their education. This has specific implications to (1) accounting educators responsible for providing curricula content relevant to today's increasingly digital

business environment and to (2) CPA Canada for updating the CPA Competency Map to bring it more into line with the insight that will help future CPAs connect changing business models to relevant performance management information.

SECTION 1

PERFORMANCE METRICS IN AN INCREASINGLY SAAS-BASED WORLD

The 2019 Annual State of Canadian SaaS¹ reported that Canadian SaaS companies received a cumulative \$5.13 billion in capital investments in 2019, a 213 percent jump from 2018. This easily surpassed even the most optimistic predictions and continued the trend that makes SaaS one of the fastest growing business models in existence today.

Globally, according to Forrester Research², the global SaaS market will increase to \$100B by 2020. Interest is also high in SaaS organizations because it has been estimated that subscription-based businesses, such as SaaS, are growing revenue at more than 5X the rate of the S&P 500 index³.

As the number, size and revenues of SaaS organizations continue to grow, there is a corresponding need for solid financial acumen to assist in the planning and execution of SaaS corporate missions. For CPAs, this represents an opportunity to contribute expertise to an emerging high growth industry based on innovative business models. However, as many CPAs and other financially trained individuals have learned, SaaS companies often differ from other industries in terms of business models and what investors, boards and senior management think is important to manage, monitor and drive the SaaS organization. How well prepared are finance and accounting professionals to understand and work in the rapidly changing SaaS ecosystem? How different is a SaaS vs. a traditional business? How do these differences affect the frequency and reporting nature of company results? What are the most important metrics that successful SaaS companies are tracking? How should finance professionals react when they learn, for example, that GAAP (generally accepted accounting principles) regulations are little more than an afterthought in most SaaS firms and traditional measures of progress, such as profit and ROI, are secondary to other non-traditional performance measures such as ARR (annual recurring revenue), gross/net churn rates and CAC (cost to acquire a customer).

For CPAs, becoming involved in SaaS business models requires a different mindset and different tools from those they encountered during their formative education and training years. A better understanding of SaaS models and metrics will provide an opportunity for them to effectively contribute financial expertise to a high growth industry often driven by entrepreneurs with little knowledge of finance and accounting.

THE PURPOSE OF THIS WHITE PAPER

The purpose of this White Paper is to provide insight into the characteristics of SaaS-based organizations and to provide a comprehensive look at the key metrics needed to understand and optimize a SaaS-based business. Broadly, the audience for this White Paper is any SaaS business executive who wishes to better understand what KPI's (key performance indicators) are most critical to manage in this rapidly expanding digital environment. However, the primary targeted audience are those individuals in the accounting and finance units of such businesses who need to better understand why traditional performance metrics are not as useful in guiding corporate SaaS strategy. Many CFO's, Controllers, VP's of Finance and Board Directors were, and continue to be, trained to become CPA's or CFA's using curricula and educational materials focused on "traditional" business models. Few of these programs, or their subject matter, effectively address the transition in management control systems and performance metrics that has occurred in software and subscription-based enterprises. For example, even today, few newly minted graduates from accounting and finance programs know about, or appreciate the managerial implications of metrics for companies whose primary goal is often not profitability nor

1 (Kirkwood, 2019)

2 ("2019 State of SaaS The Canadian Landscape," 2019)

3 (Gold, 2018)

ROI, and whose Boards and investors place heavy emphasis on non-GAAP measures of growth, financial velocity and funnel economics.

We believe that the White Paper will be particularly useful to: (1) those individuals who have decided to join a SaaS enterprise in a finance/accounting capacity; (2) professions such as CPA wishing to support their members by adding contemporary SaaS material to their training resources and, (3) university and college business departments wishing to refresh their educational curricula to better represent changes taking place in digital business models and in the performance evaluation approaches commonly used in these emerging organizations.

We hope this White Paper will provide guidance in the effective use and interpretation of metrics designed for a SaaS-based world. While we draw on previous literature, posts and blogs, a key feature of the publication is the insight gained from a series of interviews conducted with (1) key C-suite personnel in diverse SaaS-based businesses (2) institutional users of SaaS-based products and services (3) directors and mentors involved in accelerators and incubators – the breeding ground of many SaaS organizations and (4) investors who provide seed and venture capital to various levels and at various times to SaaS companies.

WHAT IS A SaaS-BASED BUSINESS⁴?

Wikipedia⁵ describes Software as a Service (SaaS) as a software licensing and delivery model in which software is licensed on a subscription basis and is centrally hosted. Sometimes referred to as “on-demand software”, “hosted software” or “web-based software”, SaaS has increasingly gained popularity in the last several years. A principal reason for this is that by delivering cloud-based services over the internet, SaaS providers remove much of the expense and hassle associated with acquisition of on premises hardware, maintenance and management of in-house software and deployment. Customers are spared from accumulating expensive IT infrastructure like servers, data centers or administrative personnel. Instead, customers pay a subscription rate that gives them full-service access not only to the software but also to the upgrades, maintenance and support offered by the SaaS provider. SaaS providers assume much of the responsibility for security, availability and performance of specialized software for which they charge a monthly or annual subscription fee. This rapidly growing delivery model is now common in business applications that range from accounting to enterprise resource planning to human resource management.

There are pros and cons regarding the savings and intangible benefits accruing to organizations that adopt new SaaS initiatives. Some evidence indicates that established companies can realize significant cost savings when they move some, or all, of their IT operations to SaaS providers. Smaller organizations appear to benefit by outsourcing many of their IT needs to SaaS providers in terms of cost savings, ability to scale more quickly, obtaining access to the latest upgrades and, in general, achieving a quicker time to seeing benefits⁶. A study by Computer Electronics found that that organizations utilizing cloud computing save on average more than 15% in IT spending, whether measured as a percentage of revenue or on a per-user basis⁷. Other, usually larger firms, however, report that the cost/benefits associated with switching from legacy, home-grown IT systems, or Perpetual Models⁸ to SaaS-based solutions are not yet clear. The reasons for this can be complex and include economic, privacy and security considerations and will be discussed further in a subsequent section. However, the trend is apparent. As one writer noted, startups and SME’s start with subscription models and legacy

4 There are numerous good descriptions of the pros and cons of SaaS-based businesses that can be easily located on the web. One example is <https://digitalguardian.com/blog/what-saas-company>

5 (“Software as a service,” 2005)

6 (Sylos, 2013)

7 (“Cloud Users Spend Less, Spend Smarter on IT,” n.d.)

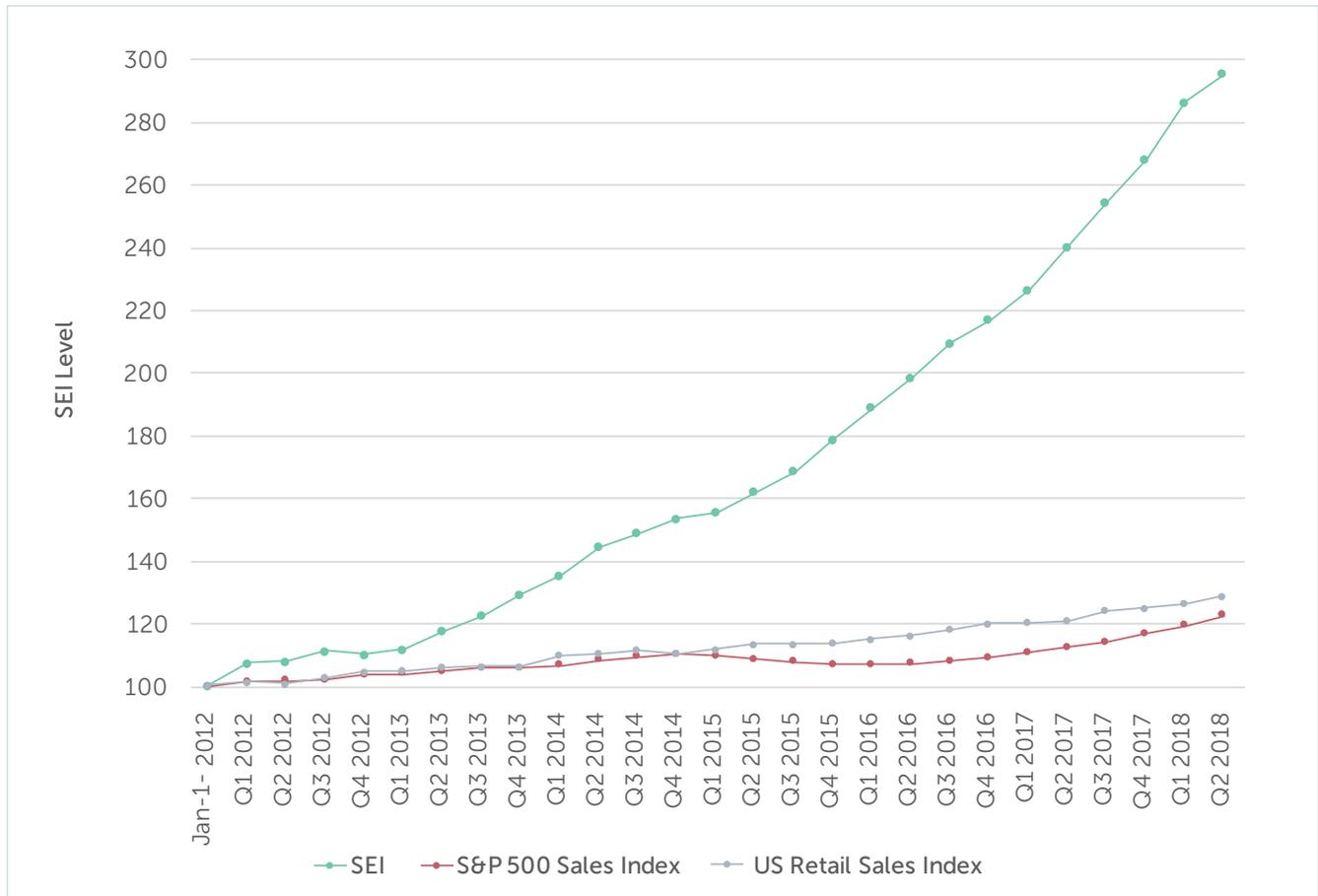
8 Perpetual licenses charge customers an initial cost (to purchase the license), plus an annual subscription cost that entitles the owner to all updates and technical support. With subscription models, customers pay either a monthly, quarterly or annual price that includes software, all updates and technical support. For additional insight, see, <https://flgpartners.com/how-saas-cfos-transition-from-perpetual-to-subscription-saas-models/>

companies switch to subscription models⁹.

As a result, SaaS services, and the organizations supplying them, have been growing at dramatic rates. The Computer Electronics study cited earlier noted that 60% of all companies had integrated at least some SaaS solutions into their business, and that an additional 36% intended to increase their investment in the months ahead¹⁰. Gartner, a global research and advisory firm providing information, advice, and tools for businesses in IT, predicts that by 2020, more than 80% of software providers will have shifted to subscription-based business models¹¹. In addition, International Data Corporation (IDC), a provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets, predicts that by 2020, 50% of the world's largest enterprises will see the majority of their business depend on their ability to create digitally enhanced products, services, and experiences¹². The SaaS revolution is part of a broad, secular shift towards a subscription-based economy that also includes telecommunications, corporate services, media and IoT. The graph below shows the degree to which the subscription economy index (SEI) is outpacing other forms of organizations¹³. The SEI reflects the growth metrics of hundreds of subscription-based companies around the world, the fastest growing of which have been SaaS/PaaS/IaaS business models.

Overall, subscription businesses grew revenues about 5.5 times faster than S&P 500 company revenues and 5 times faster than U.S. retail sales during the period January 1, 2012 to June 30, 2018.

Figure 1 - The Rise of the Subscription Economy



9 (Hanika, 2015)
 10 ("Cloud Users Spend Less, Spend Smarter on IT," n.d.)
 11 (Perry, 2018)
 12 (Afuang & Rago, 2018)
 13 (Gold, 2018)

EXAMPLES OF COMMON SaaS ORGANIZATIONS

Recurring revenue-based business models have exploded in recent years owing to cloud-enabled, pay-as-you-go services. As globalization has placed increasing margin strains on manufacturing and product sales, subscription-based businesses have benefited from stable and predictable revenue projections, data driven insights from direct consumer relationships, and large economies of scale that give rise to very high gross margins.

A SaaS model typically provides users with access to software, a platform and sometimes infrastructure, most often on a subscription basis. Platform as a service (“PaaS”) and infrastructure as a service (“IaaS”) models also provide services either on a subscription or pay-for-use basis. PaaS provides users with access to an operating system and middleware as well as infrastructure. IaaS provides users with access to infrastructure including servers, storage and networking. There is a crossover between these models and large players like Microsoft and Google are in all three segments. The focus of this white paper is on the SaaS model.

SaaS business models have become pervasive across industry sectors with a multitude of applications in such diverse fields as healthcare, education, HR, fintech, retail and transportation.

Following are examples of some of the better-known companies and applications in each of these segments.

SaaS	PaaS	IaaS
Google Apps	Google App Engine	Google Compute Engine
Salesforce	Heroku	Amazon Web Services
Dropbox	Force.com	Rackspace
Shopify	Oracle Cloud Platform	Microsoft Azure

Additional well-known SaaS products and services include Spotify, Adobe, Slack, Survey Monkey, Workday and Zoom. In the world of accounting, there are many SaaS accounting packages to choose from¹⁴. A few well-known examples include Clear Books, Netsuite, and Quickbooks online.

WHAT MAKES SaaS DIFFERENT?

These examples are indicative of the growth that is being driven by technological developments including secure cloud infrastructure, data storage, data aggregation and analytics, processing speeds, artificial intelligence, deep learning and mobile devices. Such developments have removed security and privacy barriers to adoption and have provided users with relatively easy access to emerging technologies. SaaS applications that improve workflow processes and provide access to strategic business information give companies benefits that would be more difficult to achieve within traditional IT systems. As SaaS solutions become less generalized, they become even more efficient to implement and require less customization.

SaaS, and other recurring revenue businesses, are different from traditional business models in several respects. First, from the SaaS producer point of view, the revenue for service recurs over an extended period of time (the customer lifetime). If a customer is happy with the product, service and upgrades available, they will continue with the service provider, and the profits that can be generated from that customer will increase considerably.

¹⁴ (Rudo, 2011)

This is because the marginal cost to support future software sales is generally very low and therefore high margins (often in the high 80 or 90% range) are possible on the recurring revenue. The opposite is also true, of course. A dissatisfied customer leads to costly and rapid churn along with the loss of an often-considerable investment made to initially acquire the customer. With the effective use of customer focused metrics, executives in SaaS businesses are usually able to see what trajectory they are on and react quickly.

Second, SaaS has an innate appeal to users. Since the software is delivered online and runs on the vendor's infrastructure, there is no need for multiple versions of the software. Frustrations with internal IT lead times, budget impediments and HR constraints can be avoided as can the often-lengthy capital acquisition processes associated with purchasing new systems. Corporations that replace their internal IT activities with SaaS solutions can potentially save considerable time, money, lengthy capital expenditure processes and the cost of specialized personnel.

As a result, while success is never guaranteed, organizations with recurring revenue models tend to enjoy growth rates higher than the rest of the sector. To be successful, SaaS-based firms must focus on growing their client base, increase the gross margins from each of their clients' accounts either through scale, productivity improvements or upgrades to their products and reduce client churn rate. The innovations required and the customer focus entailed in such business models will, in turn, continue to be attractive to users looking to acquire the latest software solutions while at the same time reducing the costs and frustrations of complicated approval processes associated with maintaining an "in-house" policy for IT development.

Consequently, SaaS-based businesses pursue a different roadmap from more typical organizations. In general, the road to profitability is a long one and depends heavily on the ability of the SaaS enterprise to scale quickly. Activities that need to be successfully carried out in SaaS/Subscription businesses revolve around three main actions¹⁵.

1. Acquiring the customer through a successful value proposition that resonates with the needs of the purchaser.
2. Keeping the customer through a combination of activities that help to increase the customers' lifetime value and/or reduce the potential of customer churn.
3. Achieving customer profitability through increasing the scale of operations, while focusing on reducing customer acquisition and other operating costs.

Implications to the CFO

Developing metrics that track an organization's ability to achieve success on these activities are critical CFO initiatives. By their nature, SaaS/Subscription businesses can be more complex than traditional businesses and increasingly require a constant understanding of the customer dynamics of acquisition, maintenance and marketing strategies that permit monetization. The CFO must quickly grasp that traditional business metrics fail to capture the crucial factors that drive SaaS performance. Rather, it is the nature of the SaaS business model itself that strongly influences the choice of metrics¹⁶.

The SaaS business model can be described as a "sunk cost" business. Virtually all the "investment" to write the code and create the "service" happens before the business has customer # 1. That R&D investment is typically expensed so there are significant up-front losses. And while there are ongoing updates to the code, these costs are typically much less than the initial investment to create/launch version 1.0.

When version 1.0 of the code is ready to release, the marginal cost of providing the service is minimal. In a previous world, the marginal cost of providing the software was the cost to produce and distribute the CD or DVD used to download software features onto computers. Now, with the cloud, the marginal costs are for computing, storage, and bandwidth and those are approaching zero. Compared to the costs incurred by a

¹⁵ (Caviness, 2016)

¹⁶ We are indebted to Nancy Vanden Bosch, School of Accounting and Finance, University of Waterloo, for the insights she suggested in this section.

manufacturer to make or assemble parts or to a retailer to stock its shelves, a SaaS business incurs only minimal costs to deliver its service. The sunk cost nature of the cost structure is WHY investors, board members, and executives are all so focused on recurring revenue (ARR/MRR). The more quickly this grows, the more quickly the firm can approach profitability.

Since marginal costs are so low, the focus is on adding as many customers/users as possible. As one of the biggest expenses in the SaaS cost structure is marketing and sales, the metric “Cost of Acquiring Customers” (CAC) becomes enormously important. CAC is an up-front cost “investment” that the business needs to payback before the user churns. Because of the upfront “investment” in sales and marketing, growth drives accounting “losses”. Consequently, in the early stages of their life cycles, SaaS firms show impressive growth numbers but also large losses. This is particularly disturbing to CFO’s who feel they may be in the middle of the well-known accounting quandary “we lose a little on every sale and try to make it up on volume”. In a more traditional setting, a CFO reaction might be to put the brakes on growth and to curtail the expenditures on sales and marketing activities. However, while this might lead to an “accounting profit” it would also likely mean the end of the SaaS company.

For CFO’s, managing in a SaaS world demands an understanding of this business model and the realization that SaaS metrics are being driven by the business model. Paying attention to a few key SaaS variables and focusing on metrics that relate to these variables can add greatly to the contribution that CFO’s make to the success of the firm. This white paper is aimed at helping SaaS executives, particularly those involved in the finance function to understand which variables matter most, how to measure them, and how to act on the results.

THE STUDY’S PARTICIPANTS

Appendix A provides details on the methodology used in the study to obtain the information for the following sections.

Table 1 below summarizes the characteristics of the organizations and interviewees who participated in our study including number of employees, year of company formation, annual revenues, firm profitability, and the experience of the individuals who participated in the interview process. Participating SaaS firms ranged in size from 6 to 450 employees. One third of the firms were medium in size (between 100-500 employees) and two thirds were small firms (between 5 - 99 employees). The average firm size was 118 employees¹⁷.

There is also variation in the age that the companies were formed from 1 to 18 years of age, beginning in 2001 up to 2018. Annual revenues of the participating companies ranged from <\$1M to \$50M. Typical of the SaaS industry, at the time of writing, profitability had been achieved by only one third of the firms.

¹⁷ Focusing on small and medium sized organizations is consistent with the business profile of Canada, and indeed of virtually all other major economies. Of Canada’s 1.17 million business establishments, 97.9% are considered small (<100 employees) and an additional 1.8% are medium (100-499 employees). SMEs employ 90.3% of Canada’s private sector employees. (Department of Industry, 2016)

Table 1: A Few Facts About The SaaS Companies and Interviewees

YEAR OF COMPANY FORMATION	
2001	8%
2004	8%
2011	43%
2012	17%
2013	8%
2014	8%
2018	8%

SIZE	
Medium 100 - 500 Employees	33%
Small 5 - 99 Employees	67%

REVENUE	
\$0 - 10M	17%
\$10 - 20M	66%
\$>20M	17%

YEARS SINCE GRADUATION	
0 - 10 yrs	33%
11 - 20 yrs	42%
>20 yrs	25%

EXPOSURE TO SaaS MODELS AND METRICS DURING UNIVERSITY OR PROFESSIONAL STUDIES	
None	100%

PROFITABLE	
Yes	33%
No	67%

Given the objectives of our study, it was important that interviewees possessed a detailed knowledge of the metrics being used by the organization and the various purposes for which the metrics were being applied. Accordingly, all interviews were conducted with either the CEO and/or CFO who had a detailed knowledge of how metrics were developed and used in their organizations. Overall, we were satisfied that we had a reasonable sample of respondents and that our interviewees possessed the expertise required to meaningfully reply to our questions. As can be seen in Table 1, our initial hypothesis that senior executives had little background preparation in navigating SaaS business models or critical SaaS metrics, was confirmed. Not one of our interviewees had received any formal training at universities/colleges or through professional agencies on the different operating and reporting requirements that are characteristic of SaaS-based enterprises. As will be described later, this is a deficiency that the interviewees felt must be overcome.

SECTION 2

LESSONS FROM THE FIELD

Interviewees were asked a series of questions that covered three themes. The first theme in the interview was designed to determine the demographics of the company and of the respondents. A summary of these findings is captured in Table 1 above.

The second theme was the core of the study and sought answers to the following questions.

- What are the most important metrics tracked by the Board and senior management team in the organization?
- Are SaaS metrics used primarily for strategic or control purposes?
- What is the role of GAAP in the SaaS organization?
- Who is driving the adoption of SaaS-based metrics in the organization?
- What are the issues SaaS companies face in collecting data to create robust performance metrics?
- What software packages are in use to support data accumulation and reporting?
- How are SaaS metrics used to assess the company's valuation?

The third theme was designed to permit the interviewee to add any relevant comments that (s)he felt had not been captured by the interview questions or warranted additional explanation.

Question 1 - What are the most important metrics tracked by the Board and senior management team in the organization?

Our first research question sought to identify the most important metrics used by our sample firms. Recalling that most respondents were seasoned executives with business school and/or professional accounting backgrounds, it is striking that there was little mention of the metrics normally associated with more traditional firms eg. Profit margin, ROI, EBITDA, etc.

Recurring Revenue and SaaS

First among the top five tracked metrics was recurring revenue which, depending on the firm's business model, was either in an annual (ARR), monthly (MRR) or even daily (DRR) form. There are several excellent descriptions in the literature of the various recurring revenue metrics,¹⁸ and in what circumstances each is most appropriate. For those new to the field, here are some of the distinctive features of recurring revenue metrics.

- ARR/MRR/DRR are key metrics used by SaaS or subscription businesses that have a defined contract length. ARR/MRR is the value of the contracted recurring revenue components of term subscriptions normalized to a one-year/one-month period.
- ARR is used almost exclusively in B2B subscription businesses characterized by lower transaction volumes and higher transaction values. It is effective in situations where contracts have multi year agreements or at least a minimum of a one-year contract. MRR is the predominant metric used in B2C but, to achieve

TABLE 2 THE TOP FIVE MENTIONED METRICS:	
Metric	Prominence
Gross and Net ARR/MRR/DRR	92%
Gross Churn/Net Churn	83%
Funnel Traction/Sales Conversion Efficiency	75%
CAC/Time to Recover CAC	58%
Cash Balance/Cash Burn	42%
Other: LTV; CAC/LTV; NPS; Gross Margin; ROI/Client;Rule of 40; Net Income	

¹⁸ See, for example, <https://www.saasoptics.com/saaspedia/arr>

increased levels of detail, is also often tracked by companies that are employing ARR.

- In addition to ARR/MRR, firms also use the term “NET” that is a more encompassing metric. Net ARR/MRR is the result of new period ARR/MRR + Expansion ARR/MRR (that results from upselling new product/service features) – Churned ARR/MRR (loss of contracted customers).

$$\text{Net ARR/MRR} = \text{Expansion ARR/MRR} - \text{Churned ARR/MRR}$$

- As organizations achieve higher levels of scale, participants noted the importance of accurately tracking the components of ARR/MRR to provide information on growth, momentum, trends in contract prices, net expansion/contraction of clients as well as refining ARR/MRR into cohorts, geographies, contributions per employee or FTE, and other distinctions depending on the business.
- The success and survivability of SaaS firms depend, to a large extent, on the ability to scale quickly. This was certainly the case with our sample companies. Those defined as “small” (<100 employees) experienced an average annual increase in ARR of 56%. Those classified as “medium” (100-500 employees) had an average annual ARR growth rate of 42%.
- MRR can vary dramatically from GAAP revenue due to the variance in days in the month. ARR is a better representative of GAAP revenue, but both are imprecise financial expressions and should not be confused with “reportable GAAP revenue.” Finance professionals, specifically CPAs, rarely need education on GAAP Revenue, but many are new to the subscription business and do need to understand how recurring revenue models are different from GAAP revenue. For example, in the SaaS world, CPAs must be cognizant of the differences between “bookings”, “recurring revenue”, “recognized revenue”, “deferred revenue” and “cash collections”. It was also clear from participant comments that if the business is early stage and the finance function is being handled by a bookkeeper, that individual will likely need education on these topics, as will managers in sales, marketing and product functions.

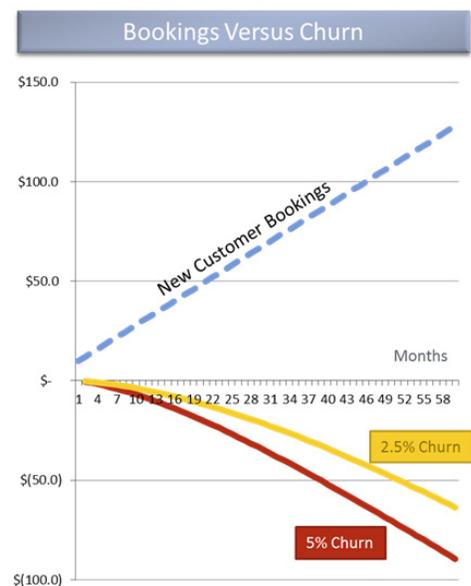
The Importance of Churn

Churn was the second most cited metric by participants in the study. In a SaaS/Subscription economy defined by term contracts, it is critical that customer expectations be met. In a nutshell, customer churn is the percentage of customers that cease to use a company’s product or service during the time frame of the contract. Gross churn rate can be determined by dividing the number of customers lost during a time period (which could be a month, quarter, semi-annually or year) by the number of customers at the beginning of that time period.

$$\text{Gross Churn rate} = \frac{\text{Users at period start} - \text{Users at period end}}{\text{Users at period start}}$$

Participants indicated that they paid considerable attention to documenting, reporting and managing existing churn and churn trends. Regular presentations of tables, graphs and other analytics that highlight current churn rates and churn trends over time were in evidence in most of our sample companies.

Gross churn rate does not consider upsell activities. A more complete metric is net churn which is gross churn less any upsell in the associated period. A goal stated by many participants was to achieve a negative net churn rate¹⁹. All firms experience loss of customers but if an organization can add new contracts, and new upsell, at a higher rate than discontinued contracts, then negative churn is possible. And while growth is an important strategy to minimize churn, well managed organizations



¹⁹ A good description of the differences can be found here <https://blog.chartmogul.com/net-vs-gross-churn-rate-best-practices/>

also recognize that it costs more to acquire new customers than it does to retain existing ones and place considerable emphasis on customer relationship management. For example, it has been reported that an increase in customer retention of just 5% can create at least a 25% increase in profit²⁰. This is because returning customers are likely to spend more on a company's products and services than new customers since they have already made a commitment to the firm.

Nevertheless, churn exists and participants in the study were not only willing to disclose their own rates but to also comment on what an "acceptable" churn rate might be. Of course, the "acceptable" metric depends on the type of business (B2B, B2C) and the nature of the business (mobile apps, software solutions, entertainment). However, our participants largely agreed that they would be concerned if their monthly churn exceeded 5% annually (expressed on a monthly basis, this would be the equivalent of .4% or 1 in 240 customers per month).

Our sample companies appear to be managing churn well within this range. However, evidence from other surveys indicates that up to 30% of SaaS providers experience churn levels higher than 5%²¹.

The clear lesson to be gleaned from our participants on churn is not only to grow the number of customer acquisitions but also to maximize customer retention.

Analysis of Funnel Economics is Critical to Survival

The growth of a SaaS organization is dependent on the acquisition of new clients and creating as efficient a sales conversion process as possible. This is referred to as traction, the funnel or funnel economics. All enterprises are concerned with the ability to convert leads into paying clients but SaaS companies, because of their focus on specific term contracts, must be particularly concerned with understanding and managing the economics of their sales conversion process.

An example of a typical SaaS sales funnel process is exemplified in Figure 3. Axonify, a Canadian technology company that manages a corporate online learning platform, describes its funnel as beginning with direct inquiries (e.g., email from an interested potential customer), the internet (e.g., webinar attendance), video views, trade-show meetings, and social media. Once these "Marketing Qualified Leads" or prospects are identified, sales personnel make first contact with potential customers by way of an "introduction call" and, if promising, follow up with a "discovery call" to gather and provide additional information. Those who remain interested in the Axonify product are identified as "passed leads." These are then transferred to another branch of the sales force for in-depth follow-up (e.g., additional calls, meetings, product demos, etc.), with the ultimate goal of closing the deal²².

For most SaaS companies, the steps involved from initiating contact (MQL/Awareness) to acquiring a new customer are extensive and costly. To continue with the Axonify example, the executive team first estimates what ARR it requires to meet Board expectations. This goal is then converted into the number of new customers and average contract price required to achieve the ARR target. Based on historical performance, marketing then estimates the conversion success at each stage of the sales process (i.e. how many introduction calls are generated from MQL's; how many discovery calls are generated from introduction calls, etc.). Since this understanding is such a critical activity, the CFO is often called on to support such analyses and quickly begins to appreciate the lengthy process that takes place to land a new client.

Figure 3
Axonify's Sales Generation Process



20 (Amarean, 2018)

21 (Murphy, n.d.)

22 (Armitage, Webb, & Pooley, 2018) Organizations use many terms to describe the steps in the funnel. For example, a similar sequence could be Awareness, Interest, Consideration, Intent, Evaluation, and Purchase

The CFO plays an important role in activities relating to the SaaS funnel. First, the CFO is likely to be involved in discussions with senior level management and the Board in order to balance the aspirations of the Board with what is possible to accomplish given the resource structure of the firm. This requires considerable skill since there is usually a significant gap between the preferences for exponential growth from the Board and the realities of what the organization can credibly achieve.

Second, (s)he will be overseeing the entire budgeting process, the majority of which, will revolve around the personnel necessary to manage the various activities and tasks within each step of the funnel. In SaaS organizations, this is where the bulk of organizational costs reside and it is not uncommon for the CFO to assist marketing and sales leaders to understand the cost/benefit of bringing on new personnel and the time expected for those individuals to provide a positive return on their salary/commission. Consequently, as events in the year unfold, the CFO needs to actively monitor and revise budget expectations to ensure top line expectations, funnel level conversions and cash flow forecasts are met.

Third, the CFO is called on to use his/her analytical capabilities to assist in optimizing funnel dynamics and improve sales team efficiency. In the Axonify example, providing an analysis that illustrates the financial impact of doubling the percentage of passed leads to new client sales could result in several operational suggestions for improvements. Finding ways to increase the passed leads/new client sales ratio could lead to (a) significantly increased ARR at the same cost level or (b) reducing the marketing budget while achieving the same ARR.

In summary, while understanding and managing the sales process is important for any business, this process is particularly important for SaaS-based organizations because it is in the marketing and sales function where most resources are spent. Our financial interview respondents indicated that, compared to other forms of business structures, they had to learn the intricacies of the sales and marketing activities to be able to actively contribute to funnel management and analysis.

CAC and Time to Recover CAC

The fourth key SaaS metric cited by our participants was the “Cost to Acquire a Customer” (CAC) and its close cousin, the “Time to Recover CAC”. Clearly, the objective of any SaaS enterprise is to achieve a CAC that is less than the total contracted value of a client. Healthy SaaS organizations look for ways to reduce CAC and improve the monetization of their clients. This is, of course, related to the understanding of funnel economics because the primary reason for quantifying and optimizing the marketing and sales funnel is to calculate and reduce the existing CAC.

Calculating CAC is straightforward but there are differences of opinion as to what should be included in cost make-up. Our respondents indicated that the general form of the calculation is to sum marketing and sales expenses over a specific time period and divide this by the number of new customers acquired in that same time period.

$$\text{CAC} = \text{Total Costs of Sales and Marketing} / \# \text{ of New Customers Acquired}$$

Differences in calculation can occur at both the numerator and denominator level. In principle, this ratio should deal simply with new clients acquired and the costs associated with acquiring them in a given period. The numerator includes the salaries, advertising, wages, tools, technologies and other expenditures that contributed to the acquisition of new customers. Some respondents indicated that they also include the costs associated with customer retention (sometimes called customer success). However, this tends to mask the intent of the metric which is designed to understand the costs associated with the acquisition strategy. Similarly, there is a variance in treatment as to whether “fixed” marketing and executive salaries as well as general overhead should be included in the numerator. Within the participant group, there seems to be no clear consensus on this other than the “principle” to include only those costs directly related to the acquisition activity. At the denominator level, only new customers should be included.

CAC by itself has limited value. Of course, it is important to know how much effort/cost is being spent to acquire a customer, however, it is the cost in relation to the value created that has the most meaning. SaaS companies do this in two primary ways. Both involve the principle of payback time, break-even analysis and associated “rules of

thumb”.

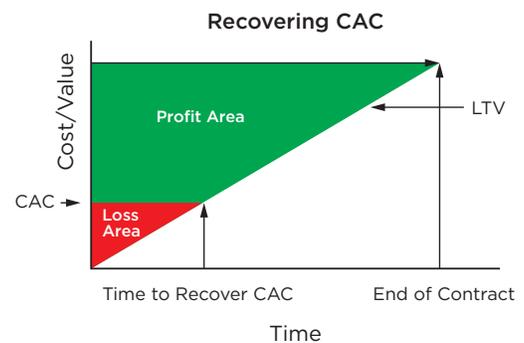
Our respondents indicate a preference for the “Time to Recover CAC”. In its simplest form, this is a straightforward determination of how long it will take before the ARR of a contract exceeds the cost of acquiring the client. A more robust calculation utilizes the gross margin, in lieu of ARR, to reflect the cost of delivery. Our respondents indicated that they look for a payback period within 12 months. The rationale for this rapid payback is to reduce uncertainty. Some investments in customers will be made that do not materialize and others may churn more quickly than expected. The goal of a one-year payback period helps to ensure that a positive return on investment for most customers is generated quickly, increasing the likelihood of eventual firm profitability.

An alternative metric to this that is widely discussed in the popular SaaS literature is the ratio of CAC to the lifetime value (LTV)²³ of the customer. Although it involves more estimation (i.e. how long is a client expected to stay with the company) it provides a more comprehensive view of the return on the CAC investment. After the breakeven point is reached, the firm can realize positive returns until such time as the contract expires. LTV/CAC ratios tend to vary but a desirable rule of thumb seems to be at least an LTV/CAC of 3 to 1.

Both concepts are similar and can be combined in Figure 4.

Figure 4

Beyond the non-trivial role of maintaining data records so that accurate “Time to Recover CAC” and “LTV/CAC” metrics can be computed, those in the finance function are called on to interact with other SaaS enterprise personnel to take action on driving improvements in these metrics. Interview respondents indicated that they were involved in discussions that ranged from pricing strategies to managing freemium products/services to optimizing the sales and marketing funnel. All these actions serve to reduce absolute CAC, time to recover CAC and LTV/CAC.



An Integrated Look at Key SaaS Metrics

The preceding pages have examined the key metrics as disclosed by participants in the study. A fifth common metric based on cash flow and cash burn is likely well understood by CPA’s so will not be described here²⁴. While we have separately documented features of these metrics (description, calculation, implications to the financial officer), it is important to point out that our respondents view these metrics as an integrated information package as opposed to stand alone measures. Several participants offered us the templates they use to routinely track and monitor their core SaaS metrics. Figure 5 is an example that incorporates ARR, MRR, CAC, Time to Recover CAC, LTV, LTV/CAC and costs associated with the sales and marketing funnel. All figures are fictional but serve to illustrate the association between key metrics. For those interested in the details of how each line item is calculated, please refer to Appendix B.

Summary of Section and Implications for the CFO

A clear message in the foregoing section for CFO’s is that SaaS-based firms follow quite different business models from the more traditional industries that formed the basis of their educational backgrounds and, perhaps, many of their earlier work-related experiences. Since these SaaS business models motivate the new set of performance metrics described above, it is useful to highlight some additional areas where the CFO can play an important role.

First, to appreciate the metrics described as important from the study’s interviewees, it is imperative that the

23 LTV is the total dollar amount a SaaS provider is expected to receive from an individual customer over the life of their account with its product. As in the earlier example on “Time to Recover CAC”, the LTV is more robustly expressed in gross margin terms to incorporate the cost of delivery.

24 Readers may note that less than half of the respondents mentioned “cash” as one of their key SaaS metrics. It should be noted that we have reported the results based on what we heard without prompting the participant. Only 5 of our 12 participants mentioned “cash” likely because cash flow is not a SaaS metric per se. Notwithstanding, our belief is that almost all SaaS organizations operate on the principle that “cash is king” and that this is a much more widely tracked metric than the results indicate.

CFO grasp the “sunk cost”²⁵ nature of a SaaS business described in Section 1 and why stakeholders have put such a strong emphasis on metrics such as ARR/MRR, Churn, Funnel efficiency and CAC as opposed to more traditional accounting measures.

Second, it is clear from the interviews that the CFO can, and should, play an important role in increasing the integrity and robustness of the metrics being utilized. For example, it is one thing to understand the importance of tracking a metric and how that metric is calculated. It is another thing to have faith in that metric and that means calculating the metric correctly and consistently. Throughout the interview process, it was apparent that metrics with the same names contained different inputs. The example in the previous “CAC” metric discussion highlights this. In principle, CAC should reflect the incremental costs associated with acquiring a new customer. However, there was a wide interpretation as to what that includes. Some restricted the analysis to the variable costs associated with bringing a new customer on board. Others included certain “fixed” costs of the sales and marketing department. Others included most of the sales and marketing costs in the calculation, including costs associated with customer retention. It is in situations such as these, that a CFO’s understanding of cost behaviour can add a needed dimension of financial understanding to firms that are heavily dependent on engineers and marketing/sales personnel. Similar observations can be made about what variables are included in LTV, payback calculations, gross margin analysis, capex vs expense, and distinctions between GAAP revenue and ARR. As the organization grows, distinctions in fixed/variable, direct/indirect, relevant and sunk costs become increasingly important to effective analysis and decision making. Initially, the CFO may be able to obtain guidance on this from how their venture capital firms wish metrics to be calculated. However, it is the CFO who should be responsible for managing this important task for his/her firm. As one respondent said of a VC mandated metric, “dividing a fixed cost by the number of new customers does not make CAC a variable cost”. This is an area where cost analysis leadership from CFOs/CPAs will pay big dividends to the organization as a whole.

25 See earlier section “What makes SaaS Different? – Implications to the CFO

Figure 5

SaaS Company - Illustrative Example of Integrated Metrics

Assumptions:					
Annual Churn %	9%				
Gross Margin %	80%				
2019					2019
	Q1 - Actual	Q2 - Actual	Q3 - Forecast	Q4 - Forecast	Total
Total New Name ARR Signed In Quarter	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 12,000,000
Total New Name MRR Signed in Quarter	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 1,000,000
Total Upsell ARR Signed In Quarter	\$ 400,000	\$ 400,000	\$ 400,000	\$ 400,000	\$ 1,600,000
Total Upsell MRR Signed In Quarter	\$ 33,333	\$ 33,333	\$ 33,333	\$ 33,333	\$ 133,333
Total ARR Signed in Quarter	\$ 3,400,000	\$ 3,400,000	\$ 3,400,000	\$ 3,400,000	\$ 13,600,000
Total MRR Signed in Quarter	\$ 283,333	\$ 283,333	\$ 283,333	\$ 283,333	\$ 1,133,333
Lifetime Value					
ARR (New Customers)	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 12,000,000
# of New Customers	24	24	24	24	96
Average ARR New Customer	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000
License Gross Margin %	80%	80%	80%	80%	80%
Average Deal Length (Years)	5	5	5	5	5
Churn Rate	9%	9%	9%	9%	9%
Lifetime Value Signed in Quarter	\$ 10,920,000	\$ 10,920,000	\$ 10,920,000	\$ 10,920,000	\$ 43,680,000
Average Customer Lifetime Value	\$ 455,000	\$ 455,000	\$ 455,000	\$ 455,000	\$ 455,000
Cost of Acquiring Customers					
Sales Salaries	\$ 800,000	\$ 900,000	\$ 1,000,000	\$ 1,200,000	\$ 3,900,000
Marketing & ODR Salaries	\$ 500,000	\$ 600,000	\$ 600,000	\$ 600,000	\$ 2,300,000
Marketing & ODR Operating Expenses	\$ 552,600	\$ 683,667	\$ 683,667	\$ 683,667	\$ 2,603,600
Travel & Other Sales Expense	\$ 378,175	\$ 183,908	\$ 186,908	\$ 291,408	\$ 1,040,400
Commissions On Sales	\$ 396,446	\$ 748,378	\$ 704,871	\$ 704,871	\$ 2,554,566
	\$ 2,627,221	\$ 3,115,953	\$ 3,175,446	\$ 3,479,946	\$ 12,398,566
Magic Number	1.04	0.87	0.86	0.78	0.88
Ideal Range for Magic Number (> 0.7)	> 0.7	> 0.7	> 0.7	> 0.7	> 0.7
Average Cost of Acquiring Customers in Year	\$ 109,468	\$ 129,831	\$ 132,310	\$ 144,998	\$ 129,152
Ideal Range of Average CAC (\$75k - \$200k)	\$75K - \$200K				
Months To Recover CAC	13	16	16	17	15
Ideal Range Months To Recover CAC (<12)	<12	<12	<12	<12	<12
LTV to CAC	4.2	3.5	3.4	3.1	3.5
Ideal Range LTV to CAC (>3x)	3x	3x	3x	3x	3x

Question 2 - Are SaaS Metrics Used Primarily for Strategic or Control Purposes?

Having gained an understanding of the types of metrics being tracked in SaaS businesses, we wanted to know how the metrics were being used. For this research question and the related discussion, we asked whether the metrics were used primarily for strategic or control purposes.

The interview participants indicated that metrics were used both for strategic and control purposes, however, the emphasis was more for strategic reasons.

Feedback from the participants indicated the extent to which SaaS metrics were ingrained in business strategy and operations. In general, based on the experience our respondents had during their working careers, it appears that metrics are used more extensively by SaaS-based businesses than by non-SaaS businesses.

There are key linkages between metrics that are used to drive and test business and financial models. As an example, ARR and MRR might be forecast based on budgeted sales resources that drive leads into the sales funnel, lead conversion efficiency, other funnel metrics and upsell and churn metrics. An understanding of the linkages between metrics is crucial for management decision making to maximize ARR and the value of the business.

The value and importance of sales funnel analysis was highlighted by several participants. As noted earlier, funnel analysis isn't unique to SaaS businesses, but it seems to be used in a more integrated way with other SaaS metrics. Monitoring sales opportunities through the various stages of the sales funnel was being done by several participants on an ongoing basis. The related metrics were used to hold sales personnel accountable and to drive forecast ARR and MRR. Sales conversion efficiency was a key indicator in driving revenue metrics and the recovery of customer acquisition costs.

Following are examples provided by participants of how SaaS metrics are used.

Table 3 - Strategic and Operational Aspects of SaaS Metrics

STRATEGIC	OPERATIONAL (CONTROL)
<ul style="list-style-type: none"> ■ As key assumptions in developing financial, business and budget models. ■ Company metrics used to compare to industry metrics to help assess performance. ■ To make investment decisions including customers, lines of business and geographic segments. ■ To make resource allocation decisions such as resources to customer success initiatives or sales support if customer churn is an issue. 	<ul style="list-style-type: none"> ■ To determine incentive compensation - e.g. sales staff based on ARR or MRR and customer success based on net customer retention. ■ Sales funnel analysis and conversion efficiency are used to forecast MRR. ■ Customer acquisition cost is used to assess the effectiveness of sales and marketing expenses.

The value of metrics is dependent on the quality of the underlying data. Participants emphasized the importance of data integrity, particularly in the sales funnel, and the need to start capturing data at an early stage in a company's evolution. See Section 3, "On the Importance of Data and Data Integrity" for additional detail on this topic.

Question 3 - What is the Role of GAAP in the SaaS Organization?

For our third research question we were interested in determining the relevance of GAAP to the management and key stakeholders of SaaS companies. The response was conclusive - it isn't very relevant!

Overall, GAAP-based financial statements and related accounting data were seen by study participants as providing historic or lagging information that is not relevant in managing and growing a SaaS business.

Conversely, SaaS metrics focus on information that provides insights regarding the unique aspects of the SaaS business model. The metrics require some data from standard accounting systems, but much more data and information are required regarding customers and customer behaviour. Churn and customer retention metrics are examples where data on customer behaviour is utilized.

Participants indicated that net income or loss determined on a GAAP basis was generally not relevant to them or to their investors. There was much more focus on SaaS revenue metrics, expense management and cash flow. Profitability isn't an expectation of SaaS businesses until companies are mature. Even then, it isn't as significant a factor in assessing financial performance as it is for non-SaaS businesses²⁶.

Participants indicated that for small SaaS-based companies, GAAP financial statements are used primarily for tax filing purposes. The focus of these companies is customer acquisition and financial statements and traditional metrics are not seen as providing the information required to support these priorities.

For larger SaaS-based companies, GAAP reporting is required for external stakeholders such as lenders, government granting agencies and some investors. For internal management purposes, the focus is on SaaS metrics. External users of financial statements are beginning to request SaaS metrics and related information. As an example, some lines of credit with banks are based on MRR or ARR.

Investors who participated in the study indicated that GAAP financial statements did not provide the information that is most relevant to them. One of the investors indicated that, in their view, financial statements include copious notes driven by GAAP disclosure requirements, but the information in the notes doesn't meet the needs of SaaS investors. Key metrics such as ARR and MRR can't be derived from GAAP financial statements and accordingly are not subject to audit review. It was also observed that accounting firms generally aren't knowledgeable about SaaS business models and metrics. As a result, they don't provide companies with insights that are seen to contribute to the success of the business.

Participants were critical of the overall education process for financial professionals. They believe the focus is on financial accounting and GAAP reporting that provide insufficient emphasis on evolving business models such as SaaS. The lack of knowledge about SaaS business models extends beyond financial professionals. One of the participants commented on the challenge of dealing with external parties accustomed to GAAP reporting and information stating, "We do have some explaining to do depending on the audience that we are speaking to, whether it is our bankers or potential new investors or other funders." Sections 3 and 4 expand on these GAAP limitations

A participant summarized the feedback we received, "GAAP revenue and GAAP accounting are sort of irrelevant."

Question 4 - Who is Driving the Adoption of SaaS-Based Metrics in the Organization?

For our fourth research question we were interested in gathering participants' insights as to who in their company drives the use of SaaS metrics.

Overall, the responses indicated that the drivers tend to vary with the stage and size of the company. For most early stage companies, the metrics are usually driven by the founder. Founders acquire knowledge of SaaS metrics from various sources including websites, blogs, and incubator programs. In these cases, the metrics initially tend to filter up to the board and investors. Founders who drive metrics, understand the importance of key measures, such as ARR, to the valuation of their business. They also use metrics to manage or control operations.

For later stage companies that have more sophisticated boards and Venture Capital investors, there tends to be more engagement of the board in driving the use of SaaS metrics along with the CEO or founder, particularly

²⁶ As the SaaS industry matures, we expect the focus on the top line to transition to the bottom line. Today, we see extreme valuations based on growth and investor hope. There will be a point, however, when investor patience wears thin and the quest for profitability will become increasingly important.

if VC investors specialize in, or have experience with, SaaS business models. Engagement at the board level provides more reporting structure and drives another element of management accountability for metrics and performance in the company. Interview participants who work in these companies, acknowledged the value-add that these investors and boards bring to the company. Management teams focus on metrics that are important to the CEO and the Board.

It was our observation that CFO's generally weren't the prime driver of metrics in SaaS-based businesses. This may be the result of CFO's typically joining start-ups at a later stage of development after the founders have become familiar with, and have implemented, the key metrics. CFO's often go through a learning process when they join SaaS-based businesses, in part because their education has not prepared them for the SaaS model and related metrics. CFO's do play an important role in ensuring the integrity of the data used to generate metrics and in reporting and analyzing metrics. There was agreement amongst participants that CFO's could add more value to businesses if they had exposure to SaaS models and metrics earlier in their education.

Question 5 - What Issues do SaaS companies Face in Collecting Data to Create Robust Performance Metrics?

For our fifth research question, we determined that manual processes, missing data in systems, and data consolidation were the top data related issues identified by the study's participants.

All performance metrics rely on data sets generated by operational information systems that support the main processes in a company. SaaS metrics are not an exemption to the rule. Here are the common issues experienced by the study's participants in their quest to collect, manage and report data that produce robust performance metrics.

For SaaS companies, the general data flow stages are Data Access, Data Extraction, Data Transformation, Data Load, Metric definition, and Metric presentation. This flow is commonly used in Business Intelligence and Business Analytics solutions. Although not all the participants in the study were using Business Intelligence or Analytics suites, the data flow in Figure 6²⁷ illustrates what stages are most commonly involved for each issue.

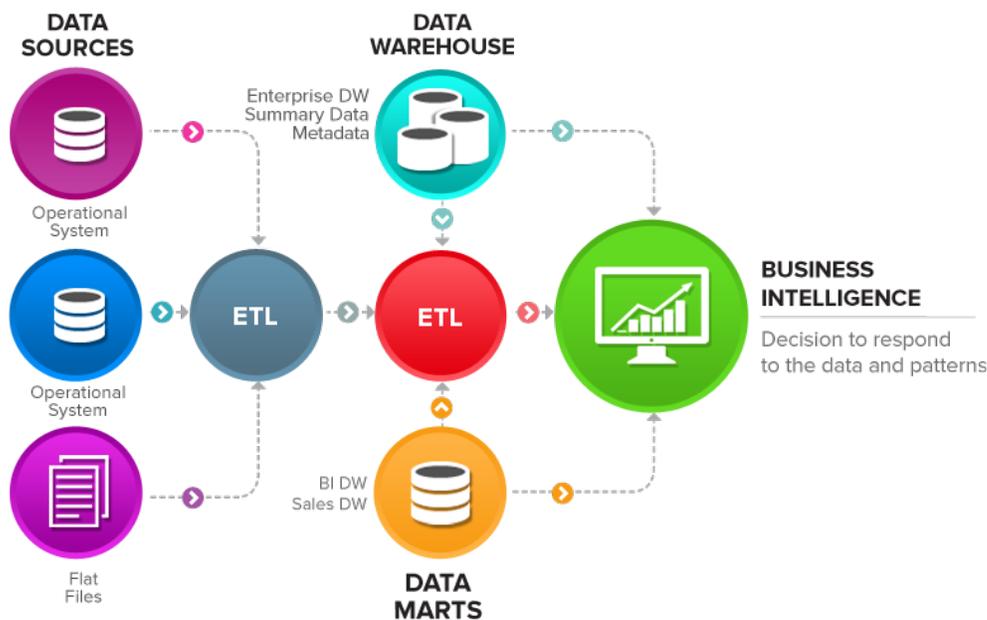


Figure 6.- Business Intelligence Data Flow (ETL refers to Extract, Transform and Load)

27 (Empress Infotech, n.d.)

Manual processes

Manual processes are slow, error-prone, and unscalable²⁸. 66% of participants reported using manual processes to extract, load or calculate data to build the company metrics. One half of these participants defined their data collection process as difficult or very difficult. The number of manual steps needed to calculate a metric, the data processing time, and the volume of data required, were the main areas of difficulty.

88% of small companies in the study described using manual processes to collect data, update and present SaaS metrics²⁹. In contrast, only 25% of medium-size business employed manual processes.

Missing data in systems

Data completeness is related to missing data and denotes the degree to which all required data is available in the dataset.³⁰ “*Collect data as soon as possible*” was the advice from one participant when explaining the consequences of not having enough detailed raw data as part of the operational system. Performance metrics need data and systems must be developed and configured to capture meaningful transactional data to build and track SaaS indicators. Equally critical is the role of updating the system with high-quality information on time. 25% of participants experienced this problem and their pain points are mostly focused on their CRM and sales platforms.

Two examples of missing data highlighted by our participants were (1) new bookings that were missing in the sales system, and (2) in long sales conversion cycles, sales representatives often neglect to update deal status.

Data consolidation

Data consolidation refers to the collection and integration of data from multiple sources into a single destination³¹ and, if not executed well, data consolidation activities can lead to integrity issues or inconsistencies within a reporting time interval.

Company size and experience matters here. Firms with less than 65 employees faced more challenges when extracting and consolidating data than larger, more mature, organizations. The latter have reached the stage where their data extraction and consolidation processes are more developed and efficient. Two issues identified by our participants were (1) the difficulty of creating custom data models to track and reconcile data from sales and customer success, and (2) the isolation between the core SaaS platform and accounting systems complicated the traceability of revenue and customer billings.

Participants considered automation, systems integration and a dedicated data team as potential solutions to improve most of their data-related issues. Section 3 expands on their insights and advice to prevent and overcome issues in collecting data to create robust performance metrics. Since many SaaS CFOs are heavily involved in sales funnel management and analysis, ensuring data integrity and efficient data retrieval systems is an increasingly large part of CFO responsibilities.

Question 6 – What Software Packages are in Use to Support Data Accumulation and Reporting?

Salesforce, Excel and Quickbooks were identified as the top three software packages used to support data accumulation and reporting.

The study showed a relationship between increasing ARR and information systems maturity levels. Specifically, companies with higher ARR were using more advanced software, such as workflow automation and data warehousing platforms, to accumulate and report data. In contrast, companies with lower ARR were mostly

28 (Mindfield Insights, 2018)

29 Some manual processes examples from our participants are: (1) Manually dump information from operational systems to spreadsheets or databases to compute SaaS metrics. (2) Manually reconcile data from different systems to compute SaaS metrics.

30 (“Supervisory Data Quality Framework,” 2016)

31 (“Data Consolidation - Definition from Techopedia,” n.d.)

using transactional and operational systems without automated or specialized reporting tools. Interestingly, 88% of the packages used by participant SaaS companies were provided by other SaaS-based organizations. These products covered the areas of marketing, sales, enterprise resource planning (ERPs), customer relationship management (CRM), accounting, and data warehousing. All participants in the study were using at least one 3rd party SaaS product as part of their systems suite.

The software list obtained in the study organized by the participant's ARR (\$CAD) was:

\$0 to \$10 Million (CAD) ARR

- **Custom built software** - In-house system to accumulate and report data.
- **Funnel Cake** - Marketing, sales and customer success software.
- **Github** - Software development platform.
- **Hubspot** - Marketing, sales, and service software.
- **Netsuite** - Business management suite, encompassing ERP/Financials, CRM and ecommerce software.
- **Quickbooks** - Accounting software package.
- **Salesforce** - Marketing, sales, commerce, and service platform.
- **Spreadsheets** - Excel and Google Sheets.
- **Xero** - Accounting software platform for small and medium-sized businesses.

\$11 to \$20 Million

- **Intact IQ** - Industry-specific ERP.
- **Quickbooks** - Accounting software package.
- **Salesforce** - Marketing, sales, commerce, and service platform.
- **Spreadsheets** - Excel and Google Sheets.
- **Vena** - Enterprise budgeting, planning, and revenue forecasting.

More than \$20 Million

- **Netsuite** - Business management suite, encompassing ERP/Financials, CRM and ecommerce software.
- **Redshift** - Amazon Web Services data warehouse product.
- **Salesforce** - Marketing, sales, commerce, and service platform.
- **Service Now** - Digital Workflows for enterprise
- **Spreadsheets** - Excel and Google Sheets.

Question 7 - How Are SaaS Metrics Used to Assess the Company's Valuation?

For our final research question, we asked interview participants for feedback on how SaaS metrics are used to value their companies. Our objective was to obtain high level observations and not to discuss detailed valuation principles. We were interested in participants perspective on how SaaS metrics are used to determine, or test, valuations for ongoing information and planning purposes or for such possible transactions as financing, sales or stock option grants.

Not surprisingly, due to the importance of the ARR metric, respondents indicated that valuations are typically based on a multiple of ARR, or that a multiple of the ARR approach is used in tandem with other methodologies. Understanding that VC's and other sophisticated investors focus on the multiple of ARR approach is important for companies anticipating financing or sale transactions if their objective is to maximize value. Specifically, they need to understand the factors that influence multiples.

One of the investor participants identified the following factors that impact multiples.

- The revenue growth rate, particularly the rate of growth in ARR/MRR.
- The total addressable market and market potential for the service or product.
- The company's ability to retain customers or minimize churn.
- Service or product gross margins.
- Cash EBITDA (EBITDA adjusted for non-cash expenses or revenue).
- Status of the technology in its development cycle.

Participants believe that revenue growth rate is likely the most impactful factor driving multiples. Investors in SaaS businesses are looking for high growth opportunities and will pay a premium price for them. Other metrics not noted above that would be taken into consideration include the cumulative LTV of customer contracts, the time to recover CAC and the Rule of 40³².

It was also noted that the high demand for SaaS companies by investors has likely driven up ARR multiples and therefore valuations. CPA's need to be aware, however, that in this rapidly changing business environment, demand can change over time. It was also pointed out that in the valuation process for privately owned businesses, public company multiples are often considered. Typically, the revenue growth rate of smaller private companies is higher than larger public companies. The use of public company multiples might understate the value of smaller private companies.

As noted in Appendix C, there are numerous sources of information available that enable the CFO, management and stakeholders to identify and assess key metrics. Using this information and considering the factors noted above, enterprise value creation can be monitored on a regular basis. Some participants monitor valuation range estimates regularly as input for financing and other strategic decisions. Others only determine valuation ranges in anticipation of specific transactions or events.

Overall, in order to maximize value, SaaS companies should closely manage and monitor all the key metrics with a particular focus on ARR.

³² The rule of 40 formula states that (Growth % plus Profit Margin % \geq 40%). For example, if the growth rate in ARR is 28% and the Cash EBITDA during the growth period is 12%, the rule of 40 has been achieved. The rule of 40 assists in determining the health and/or attractiveness of a SaaS company by examining the balance between revenue growth versus margins. Note that since many SaaS firms are not profitable, Cash EBITDA is used as the margin variable.

SECTION 3

PARTICIPANT INSIGHTS

Section 1 described the rise and importance of SaaS in the economy and Section 2 highlighted the core SaaS metrics and information regarding their use, governance, development and application.

In this section, we describe the experiences of participants with respect to their preparedness to head the financial activities of a SaaS company, the reality of what they deal with, reflections on what are the most important ingredients for job success and advice they would provide to new individuals beginning a financial role within SaaS. Respondents provided rich and diverse comments on this theme. Differences, of course, exist depending on the size and focus of the firm, however, a few key themes emerged from our interviews³³.

Theme: What is the Role and the Most Important Considerations of the Job of Chief Financial Officer in a SaaS Firm?

On the role of the CFO

- The role of the CFO is to figure out how to value and talk about the businesses in which they are involved or decide to acquire. So, I think regardless of whether SaaS is a disruptor of anything, it all comes back to the basic principle that you need to actually figure out what the key business model and metrics are that are going to drive your company and reshape around that. SaaS is a focal point today, and it will be cool for a long time, but at the end of the day, I think the general skill of actually thinking about what matters, measuring, reporting, planning and fixing things in a chaotic environment are skills that we need and we're not going to get away from that.
- My role is keeping a pulse on the overall health of the company and raising alarms or concerns when something is amiss. Our metrics help here. In addition, I'm also our legal department which takes up quite a bit of my time. There's a significant customer service part of our finance department so our group needs to stay on top of that both from the plain customer service side as well as from a functional side like making sure that all these payments are being kept completely correctly and made on time.
- (comment from a CEO re: responsibility of the CFO) A major role for my CFO is to deal with potential funders. Currently my CFO may talk to ten possible investors. I will meet them for an hour but it's his job to do the lengthy due diligence on each of them which I don't currently have time to do. That's his number one job - get the 10 term sheets and grind them down to the best one. A good CFO is invaluable in helping to get the best deal. For example, we just closed a deal at prime plus zero with no setup fees - its almost free money. This involves a lot more than knowledge of GAAP statements. The other big category is legal. We don't have a chief legal officer, so the CFO is the Chief Legal Officer for every contract we are involved in.

On the Importance of Data and Data Integrity

- I've said it before, but I can't say it enough - the importance of gathering data early and the importance of ensuring that data's integrity. You can have all the systems in the world, and all the best intentions in the world but if you are not actively collecting data in a way that you can easily generate information from it, then you are not collecting it properly. This requires buy in from your sales and marketing teams who are inputting the information into the system. If they're not actively updating and coordinating their leads, you are going to miss opportunities to generate additional revenue and be unable to make meaningful decisions.
- Data integrity is key. Ultimately, I'm the one sitting with the executive team and the board talking about the numbers and talking about why we think we should do A and B versus C or D. You need to make sure that you know and have confidence in those numbers that you're using to drive this. To accomplish this, I make

³³ We have edited the comments to provide additional readability. For example, we removed the "uhs, ums, you know" as well as company identifying comments and shortened lengthy dialogue. In all cases, however, we did our best to stay true to what the participant intended to convey.

sure that we have a “single source of truth” that I can reconcile all the data to in our organization. In our case, that means being able to trace everything back to such documents as our core sign order forms which I know are accurate.

- Start collecting data as soon as you can. Even if it's at the most basic level, even if you are just starting to understand the culture, even if you do not have the resources, you still need to drive that buy-in across the people that have the ability to collect and enter the information. It's not going to be perfect, but is better to be ahead of it and start to create that as part of the culture of the business and buy-in to it versus getting 10 years into a business and then look back 5 years and say “I wish I would have had that”. For me that's a huge issue.

On the Importance of Thinking Ahead

- As we grow beyond 50 people, the things I think I worry about most days are the operational efficiency issues - the day to day stuff - like a new employee expense system, travel providers, incentive schemes, a new GL system to deal with more than one legal entity. These are all happening together and if we don't get them done, we will have that much more trouble getting through the year. And so, I sort of feel the responsibility for trying to help smooth this process. As we grow, we must deal with more complexity and make sure growth doesn't slow down because of our inability to manage it internally.
- (1) Be open-minded that many of your employees do not have a finance background so they're not looking at the same lens regarding metrics and standards that you are. Try to understand their point of view.
(2) Data clean up is important - like understanding the metrics we want to track, and do we even have the correct data to track that. It is the role of the CFO to get these metrics accurately reported, set the criteria and be consistent in how we're measuring them. Being in the finance role in a SaaS company, we are bridging the gap between what we've been used to from a financial reporting standpoint to these new SaaS metrics. For example, the people here focus on ARR. Initially, I didn't even know what that meant!!
(3) Make sure that the way we're tracking stuff is consistent with others in our space to whom we wish to compare ourselves. I've found that even things such as gross margin, let alone CAC, are subject to different interpretations. We need to be consistent.
- It is important that you develop a clear path to profitability as fast as possible. And if that does not seem possible, then you need to be making a plan for looking out at least two rounds for what you're going to have to do to raise funds to stay in business.
- It is important to set targets. I don't think we had any issues in defining what our metrics should be. We were able to get good data and measures. However, what we never did is set targets!!

Theme: What Recommendations Can be Provided to New Individuals Coming into the Job?

On What to Expect

- Expect to be involved in many different areas that you might not expect. I see my responsibility as being involved in all pricing decisions, all metrics, target setting decisions, all budgeting, headcounts, growth, data accumulation, data acquisition and data integrity, chief legal counsel and to maintain a close relationship with the sales and marketing teams
- I joined a SaaS firm of 15 Engineers almost a year and a half before we had any revenue. So, my job was very much like “do everything else”. You know, it was running the books, and taking care of the banking, and doing the payroll, doing all the hiring, manage all the contracts, buy the groceries, clean up. It was everything, right.

On Understanding the Business

- First, make sure you understand the business. Take the first number of months you're there and talk to your sales and product guys, make sure you understand who your customers are and what they do. Once you understand that aspect of it, you'll really understand what you need to be measuring. I would suggest to anyone who is new to SaaS to talk to someone else that's in SaaS already. That can help them jump ahead by weeks and months in understanding the industry. Then get a pulse on what really matters in the business.

For example, for us, it is controlling our product development cost in such a way that we know that what we're investing in is going to help us deliver revenue versus investing in things that won't.

- Understand the business. What we look at and measure here is much different than the last company that I was at which was also a SaaS company, and which had its own unique struggles and challenges. So, it's critical to immerse yourself in the business, understand the operational side of things and understand more of the why behind what you are doing and trying to accomplish.
- Recognize that every business is going to be unique and there's no copy and paste formula that is a magic bullet. Focus on those metrics that are important for your product or your business. For example, there is a lot of interest in customer acquisition cost, however, that may not be important to your particular business model. In our case, for example, because our software sits on the client's cloud, we can take in all their operational data and produce a unique metric that is more meaningful to us - ROI/client.
- Make sure that you're using the metrics that are useful to your business. There are dozens of them out there but that doesn't mean they are all applicable. Second, make sure that you know why you are using them. It really comes down to understanding your business then cross referencing that to the applicable metrics that are out there rather than just measuring a bunch of canned metrics. That is a waste of time and no help to your business.
- Whether you're already in or about to join a SaaS company, consider joining a network of CFO's in similar companies and do some self-studying about the SaaS world.

On What's Important

- I totally underestimated the need to build really strong data infrastructures. Spending money on accumulating data and building a data team is expensive, but it is way more expensive making poor pricing decisions. It is something I think many incoming accounting/finance folks underestimate.
- When I joined the firm, I just did not have any insights into SaaS and so I had to learn the models. Luckily, I had a CEO that was focused on running this business by the numbers and making them more and more useful over time, so that was definitely a big factor in my education. However, this is not common in a SaaS firm so my advice would be to prepare for the SaaS world prior to being part of it.
- Get comfortable with the SaaS-based metrics for your industry. Also, start off simple, don't try and pick 13 metrics to follow. It may not sound like a big number, but it is a big number mostly because of the next 26 that feed into that 13 - you get overwhelmed pretty quickly. Pick 3 or 4 to start and get everybody used to it. Also, understand that this isn't a finance show - a lot of it must be owned by the operational groups that are actually contributing one way or another to them. So, part of your job is helping others to understand that it is part of their job to be excellent just like everybody else is, and therefore that's why they should understand these metrics and own them too.
- Cash in the bank at the end of the month both now and going forward is the only thing that matters. Everything else is secondary.

On Dealing with Investors

- If I had known what I know now, I would have had a real heart to heart with each of the board members and investors and ask, "what is it that you guys are focused on, what's the timeline at your fund, when do you need to exit, what metrics are most important to you? How do I give you as much value as possible?" You know, I didn't know that early enough and it is critical to the role of any CFO.
- I think one important thing to consider if you've raised or going to raise money from seed investors or series A investors, is to ask them for their input. The investor group or venture capitalists will tell you what is important to them. Don't be afraid to ask. For example, one of our early investors would send me stuff about what others are doing that we should be looking at. It is critical that you stay in touch with your investor group.

Theme: Should Universities/Colleges/Professional Agencies be Providing More Training into SaaS-based Models and Performance Metrics?

SaaS-based business models have only sprung into the mainstream in the last ten years so it is understandable that educational institutions and professional associations would be slow to change or even modify their existing accounting and finance curricula. Still, it is noteworthy that not one of our participants had any formal training in either SaaS business models or in the contemporary metrics that have evolved to support them.

As noted earlier, many CFO's, Controllers, VP's of Finance and Board Directors were, and continue to be, trained to become CPA's or CFA's using curricula and educational materials focused on "traditional" businesses. Few of these programs, or their subject matter, effectively address the transition in management control systems and performance metrics that has occurred in software and subscription-based enterprises. An inspection of leading financial and managerial accounting textbooks shows a focus on GAAP based rules and procedures (financial accounting) or on tools and techniques designed for a manufacturing or retail world (managerial accounting). A recent discussion with several senior management accounting educators revealed that none of them incorporate any SaaS concepts or measures into their courses³⁴. Here are a few comments from the participants regarding this issue.

- Well, I think it should be included at least as an elective or some type of add-on. My biggest ask is to make the curriculum relevant to students that come out of school. If they're talking about GAAP, unfortunately, that's not the most helpful viewpoint on numbers. It's too far removed from somebody who's trying to run a business who is more tied to cash flow and other metrics of success. So stressing relevance, I think SaaS performance metrics should be incorporated for sure.
- I believe you need a foundation in terms of understanding business models, finances and metrics. Additionally, I think there's very little done in terms of understanding the value of a company. As a founder trying to raise money, this was an area that I needed more insight on. It's not just arriving at a valuation but also understanding the different motivations of specific types of investors, the various funding instruments (equity vs debt) and the implications of what's written in the term sheets from a point of retaining or giving up control.
- I think universities and professions need to decide if they want to support "tech" accounting or not and understand that it's going to look like quite different than the status quo.
- Most of the people who work here are so "techy" - they all grew up with these apps and use tools that I don't understand. I don't know if its possible, but university could consider teaching accounting/finance people a number of different productivity tools and apps that are out there.

³⁴ (Krishnan et al., 2019)

SECTION 4

The last section described the experiences of our participants with respect to their preparedness to head the financial activities of a SaaS company and advice they would offer to others coming into SaaS businesses.

This section examines the SaaS experience from the experiences of external participants such as institutional purchasers, investors and trainers of new generations of finance-oriented SaaS executives.

PERSPECTIVE 1: INSTITUTIONAL PURCHASERS OF SaaS PRODUCTS

Our purpose was to speak to accounting/finance professionals in large organizations that are currently using in-house purpose built or legacy IT systems and who are in the process of replacing at least some of these with SaaS products. We were interested in learning what factors are causing institutions to move from in-house software to SaaS type products and platforms and what kind of metrics are institutions/companies using to determine the cost-benefit value of switching to SaaS providers. This information should prove helpful to CFOs in SaaS companies to ensure that they are offering the kind of value propositions that are attractive to potential purchasers of their organization's SaaS products and services.

Respondents included enterprises that ranged from insurance/financial services to education/research provider to engineering consulting. They were all large and globally recognized. Participants represented non-profit and profit, publicly listed and private firms.

Before commenting on the responses by institutional participants, it may be helpful to document the degree to which SaaS organizations and their product/services are disrupting in-house IT operations and legacy software and platform services. The graph below indicates that cloud spending continues to significantly outpace traditional on premises software and, at current growth rates, the crossover point is projected to occur in 2021. Consequently, understanding the motivations and perspectives of those responsible for SaaS acquisitions is important.

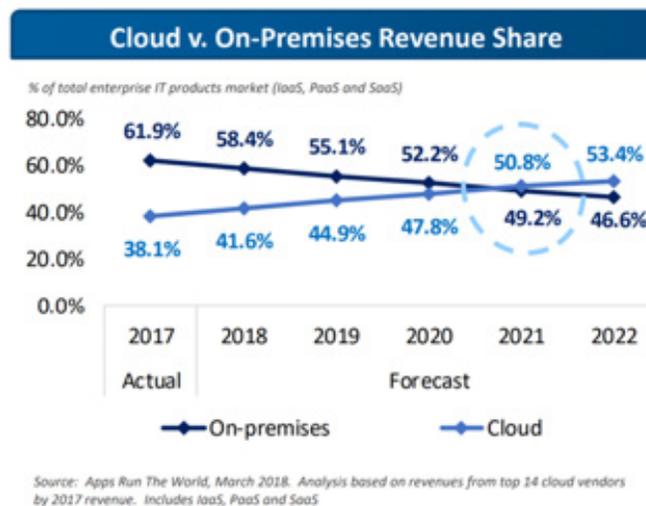


Figure 7 - Cloud vs. On-Premises Revenue Share

Why the Switch to SaaS?

In every case, organizations we interviewed indicated that legacy systems and home-grown IT platforms were being replaced by SaaS-type products. Typical of the comments received were:

- Our primary motivation for moving to SaaS is to stay up to date. It is very difficult to stay current. You get caught up in the day-to-day, you never have time to make key updates, test them and put them into practice. Consequently, we are often several versions behind where we should be and then we miss out on functionality. So, one of the big drivers, unfortunately, was to have someone force us to stay up-to-date with recent versions and get better access to functionality. Today, we are not as reliant on our existing IT infrastructure. We are relying more on the cloud people - they have more resources than we have.
- I would say a lot of organizations are looking at whether we are going to scrap the legacy system. Right now, one of our biggest scarcities is finding tech talent. That's a real challenge if you look at our systems and what the fixed costs are to maintain those. For us, then, SaaS solutions are the direction to go.

How is the Decision Made to Acquire SaaS Products?

We found a range of responses to this question ranging from intuition to formal analysis. The difficulties in making an informed analysis included several considerations that these large organizations found difficult to quantify. For example, *"understanding which, and how much, of our numerous and complex internal data analysis systems to replace"*, *"lack of clarity on who/what department makes decisions about purchasing SaaS"*; *"opportunity cost of becoming so reliant on a SaaS product that we cannot switch"*, *"lack of clear line of sight on security issues to our clients if we purchase of a SaaS product"* were representative respondent comments.

One organization indicated the use of a 4-step process to grade a new SaaS acquisition.

- Does it meet our standard for (1) IRR hurdle rate (2) security concerns (3) privacy concerns, and (4) support from the provider to assist in a global roll out. Historically, we have focused on whether the IRR meets our hurdle rate. However, when you factor in the intangibles, we are relaxing this standard. Even zero IRR may be okay when you start to look at the intangibles, the cost of the workforce over the next 30 years and the cost of getting the right skills in place. In short, in looking at SaaS, the IRR is flexible if the argument for the other intangibles is strong.

The Cost/Benefit of SaaS

It is interesting to note that institutional respondents are not only acquiring more SaaS products but also getting into the business of producing and selling SaaS solutions themselves. When this happens, they note that they rely less on metrics such as GAAP revenue, earnings, ROE and EBITDA and heighten their focus more on *"non-financial key performance indicators such as customer persistency, customer lapse rates, average number of products per customer"*.

On the specific question of the cost/benefit of replacing existing IT solutions and systems with SaaS, there were mixed responses. Most were simply not sure. Typical is the following comment that also indicates the shift in the role of the IT department.

- Very hard to know. I definitely think that the previous finance administration felt that when we went to SaaS, we'd be less reliant on our IT department and in a way, I suppose that's true because of what's been outsourced, but we still work with IT extensively. They have pivoted very quickly, and I think we find they add really good value. We have had some server issues with our SaaS provider and IT has provided us with good advice and helped us work through those issues.

Should Universities/Colleges/Professional Agencies be Providing More Training into SaaS-based Models and Performance Metrics?

Institutional respondents saw the same kinds of benefits and made the same arguments for including more SaaS-based training in the curriculum as SaaS responders. Here is a good summary comment on this issue.

- For sure - in terms of performance metrics, I think we really only scratch the surface at best through university and CPA education. It feels like the education stream is built around how do you get your CPA and CMA. I hope that we get more and more performance metrics based beyond the standard financial KPIs. When we go out and look at CPA talent, it's ironic because currently we look at your grades in university, that you've got your accounting degree and that you're doing the CPA program. But on the question of how much do you know about the many SaaS and other products and services that exist, how do you use different tools to interact and understand and use data - we're not there yet. This is important because in an organization like ours, we are in a finance transformation and are changing the skill set we hire for in accounting and finance. Historically, we have not hired the kind of people who are able to interact with different SaaS programs. Most of our applicants are experts in Excel or PowerPoint but few have knowledge of SaaS business models, SaaS metrics, Bloomberg terminals and a comfort level of interacting, understanding and interpreting data from multiple sources.

Implications for the CFO

As integral members of the management team, the insights provided by institutional responders should be valuable input to the CFO. Specifically, through understanding the purchaser's pain points (staying up to date, lack of tech talent, cost of maintaining legacy systems) and, particularly, understanding the economic process that leads to an institutional yes/no purchase decision, will help the SaaS CFO contribute to the creation of a more robust value proposition for his/her organization. A deeper understanding of a client needs and decision processes by the CFO can also lead to efficiencies in sales funnel costs, higher ARR and less customer churn.

PERSPECTIVE 2: INVESTORS

The study participants included two investors, an angel investor who is active in the tech sector including SaaS companies and an Investment Director of an investment fund that has approximately 60% of its portfolio in the SaaS sector. Several their observations were noted earlier in question 7 of Section 2. Since it is important for CFOs of SaaS businesses to understand the perspective of investors, the following is a summary of input from the investor participants.

Key SaaS Metrics

Overall, the key SaaS metrics identified by the investors were consistent with those identified by SaaS CFOs and consistent with those noted in section 2 - Question 7 of this paper. Metrics they referred to included:

- ARR/MRR
- Gross and net churn
- CAC
- LTV
- Average revenue per customer
- Funnel conversion efficiency
- Burn rate and cash flow

The level of analysis and break down of the metrics differed between the investors. The investment fund has a more structured approach to the analysis of metrics.

Use of SaaS Metrics

As expected, investors use SaaS metrics to monitor the performance of investee companies and in valuing SaaS companies that are potential investments. Following are observations made by the investors directed at CFOs.

Companies should be aware of investor expectations at each investment stage. The benchmark metrics will differ for seed stage companies compared to companies seeking series A or series B financing rounds. Management, and particularly CFOs, should understand investor expectations and track metrics accordingly. Achieving specific metrics may determine the timing of financing rounds.

Investors focus on growth and costs. They classify metrics as growth or cost in their analysis and indicated that strategies for managing growth and managing costs are more important to them than profitability. Month over month growth in MRR is one of the most important metrics.

If a product has a hardware component, there can be a lag in MRR or ARR between the time the hardware is installed and the time that revenue from use of the software component commences. This aspect of the revenue cycle is important to understand when assessing MRR or ARR.

It is important for investors to understand how specific metrics are calculated since there are differences between companies. As an example, the types of costs included in the determination of CAC varies. This understanding is important when comparing metrics against benchmarks. Also, when comparing churn rates, it is important to know whether churn has been calculated on a gross or net basis. It is the job of the CFO to provide this information.

The investors emphasized the importance for companies to start gathering data and calculating metrics at an early stage to provide trend information. They also stressed the importance of data integrity.

The Role of GAAP

Consistent with other views noted earlier, our investor participants do not consider GAAP financial statements and related information to be relevant to their needs. Their opinion is that GAAP financial statements do not include the information they require to assess the performance of SaaS businesses. Traditional financial statements based on historic information are of little value to them. Instead, their focus is on SaaS metrics and current information, particularly, information about customers.

One of the investors indicated that it would be of value to have auditors report on SaaS metrics that can't be derived from GAAP financial statements. They also observed that accounting firms don't seem to have a good understanding of SaaS business models and the related metrics. As a result, they don't provide value added insights to their SaaS clients.

The Role of Investors in the Choice of SaaS Metrics

The investors observed that founders usually drive the use of SaaS metrics in smaller, early stage companies. However, investors, particularly VC's, play a more significant role in the growth phase and in larger companies by bringing more structure to the reporting and tracking of metrics. It was noted that the sophistication of investors regarding SaaS metrics varies and that some require educating.

They also noted a variation in the knowledge level of finance professionals regarding SaaS businesses and metrics. Those without prior experience in a SaaS business don't come equipped with the required knowledge and must learn on the job. They emphasized the need for better education of finance professionals focused on SaaS business models and information requirements.

Implications to CFOs

The investor perspective is a particularly important one for CFOs. Recall the earlier comment by one CFO, *“If I had known what I know now, I would have had a real heart to heart with each of the board members and investors and ask, what is it that you guys are focused on, what’s the timeline at your fund, when do you need to exit, what metrics are most important to you? How do I give you as much value as possible? You know, I didn’t know that early enough and it is critical to the role of any CFO”*.

In conjunction with the CEO, the CFO is the face of the SaaS company. Understanding what investors are looking for and working with them cooperatively to provide essential data, is one of the most important roles that CFOs will encounter. The ability to provide appropriate metrics, ensure data integrity and display overall knowledge of the business will contribute to more advantageous terms and term sheets.

PERSPECTIVE 3: ACCELERATORS/INCUBATORS

We spoke with individuals in both a leading Accelerator and Incubator program whose responsibilities were mentorship, managing federal and provincial incentive programs and designing programs and strategies to deliver and implement in-house programs to clients. Approximately 70% of the clients in these accelerators and incubators were working on SaaS-based businesses. The vast majority of these clients consist of individuals with STEM (science, technology, engineering or mathematics) background. Other than an elective or two, few have any formal training in performance metrics.

Consequently, we were interested in learning to what extent SaaS business models and SaaS-based performance metrics are included in incubator and accelerator programs since these programs serve as a starting point for the development of many SaaS-based organizations.

As expected, SaaS business models and approaches to testing and implementing them (e.g. Lean Business Canvas, Minimal Value Proposition) are widely discussed and encouraged in incubator and accelerator programs. Important SaaS metrics are also discussed. When asked if client companies are exposed to, and educated about, SaaS metrics, we heard:

- It depends on how educated they are in this area. If they’re not educated then we will very early on talk about MRR, CAC, LTV, and churn. If they are educated, then the metrics sessions become more on what you can do to improve those things that you are tracking. For example, here’s what your model looks like if you reduce your churn by X% or if you reduce your cost of acquiring a customer by Y%. When it comes time to raise money, investors are going to need to see these metrics and, by the way, if you can’t show your MRR and the differential between the cost of acquiring a customer and that customer’s lifetime value, then you’re not going to get any money.

As the ventures begin to acquire customers, there is an increased focus on understanding the business and optimizing the funnel.

- Discussion of business models and metrics are considered in Stage 1 companies but it really starts to fly in stage 2 and stage 3 where we start to press them on business performance, delivering on their metrics to KPIs, tracking them diligently and making sure they’re setting up goals successfully. What do they look at re: metrics? For our purposes, we look at the recurring revenue number, we also look closely at the sales funnel, (activity levels, conversion rates, number of outbound touch points etc.). At the more advanced stages, we examine churn rates, customer cohorts and product segmentation.

Of interest is the fact that several mentors that provide financial and metric insight are CPA's who have had considerable experience in SaaS organizations. These individuals readily admit that during their formal education process, they had no exposure to SaaS - everything they learned was on the job. As one individual pointed out:

- I think there's a ton of value in having future financial leaders obtain a better fluency on SaaS businesses and metrics. If business students or accounting professionals work in a SaaS company, they need to understand what drives a SaaS company and the metrics they use.
- If financial people are not up to date on SaaS models and metrics, then they're focusing their efforts in the wrong direction and may double down on the wrong thing and not add value to those who need good financial advice.

SECTION 5

SUMMARY AND RECOMMENDATIONS

A summary of the study's findings appears in Highlights of the Study in Section 1. We conclude the White Paper with several suggestions directed mainly at those institutions that play a primary role in education, training and skills development for future SaaS finance professionals.

Recommendations

A consistent recommendation from participants in the study was that post-secondary training institutions and professional accounting agencies should be doing more to educate future financial business leaders about SaaS business models and SaaS based metrics. Our findings provide support for this recommendation. From our interviews, we concluded that: (1) none of our participants indicated having any formal background in SaaS models or metrics and (2) an informal survey of leading accounting academics indicated that they do not include SaaS discussions in their course materials. Given the exponential growth and increasing importance of SaaS to global employment growth and GDP, there appears to be a need for curriculum introspection.

Our view is that there is a difference in exposure between SaaS models and SaaS metrics. While certainly not part of the mainstream business curriculum, the SaaS business model is being discussed in elective courses (such as entrepreneurship, new venture creation and/or business model development) and is the focus of many on-campus facilities (maker spaces, incubators and accelerators) that encourage students to analyse their venture prospects through the lens of helpful approaches, such as the Lean Business Canvas, Minimal Value Proposition, recurring revenue models and channel choices. However, at most post-secondary institutions, such exposure is only offered as an academic "elective(s)" or through "sandbox" style workshops or incubators. Furthermore, due to having to focus on requirements of professional examinations, students in accounting/finance programs, are rarely exposed to the differences between SaaS organizations and more traditional industries. We believe there is a strong case to be made for more robust inclusions of SaaS business models in the mainstream accounting/finance curriculum, at both the undergraduate and graduate level.

An even stronger case can be made for the inclusion of discussions on the development, tracking and monitoring SaaS-based metrics. The logical location for such inclusions is in the financial and managerial accounting offerings at business schools and Schools of Accountancy. As noted earlier, the common SaaS-based metrics described in Section 2 have not found their way in any meaningful fashion into accounting or finance courses. We argue that that department heads and faculty responsible for accounting/finance curriculum matters strongly consider ways of incorporating these different, but highly relevant, business models and associated metrics, into their programs.

Similarly, we find little in the way of CPA/CFA professional workshops/programs/updates that assist members in accessing such information. Due to the growth of the SaaS industry, there would appear to be a ready market of individuals looking for this information if CPA were to provide it.

More Specifically

As described at the outset, the purpose of this White Paper is to help accounting and finance executives understand the differences between traditional and SaaS performance metrics. As our research study progressed, however, it became increasingly evident that there is a wide gap between what is viewed to be "relevant" to SaaS-based enterprises and what traditional GAAP-based accounting provides. It is clear that this gap extends well beyond the "metrics" focus of this paper. GAAP-based regulations and existing balance sheet and income statement reports are viewed more as a necessary after thought than as important value-added organizational tools. The question, at the heart of the issue, is what role should accounting play in assisting new economy organizations, such as SaaS, in providing investors and managers with relevant information about the value creation process (business model), the positioning of the company's strategic assets (mostly intangible)

and the efficiency of operations? Our respondents appear to suggest that contemporary accounting, while a regulatory necessity, is largely superfluous in supporting the needs of SaaS managers and informing investors in their quest for timely and useful information.

During the course of this research, we reviewed a remarkable publication called, *“The End of Accounting and the Path Forward for Investors and Managers”*³⁵. The authors document the failure of accounting and reporting systems to *“adjust to the revolutionary changes in the business models of modern corporations, from the traditional industrial, heavy asset-based model to information-intensive, intangibles-based business processes underlying modern companies”*. Their evidence-based critique concerning accounting’s lost relevance to both investors and managers is compelling³⁶.

In short, despite the heroic efforts by regulators to improve accounting and corporate transparency, financial information no longer reflects the factors that create corporate value for important industries in our economy. This helps to explain why, other than for GAAP reporting purposes, so few traditional accounting metrics are viewed by our participants as relevant to the investors they approach to contribute venture money to their SaaS firms.

More importantly, however, a similar lack of relevancy occurs at the management accounting level. Senior decision makers in SaaS-based organizations seldom mention balance sheet resources such as buildings, property, inventory or equipment. It’s not that these items are unimportant, rather they are not the differentiators that create future value in these firms. Instead, respondents allude to the effective acquisition and deployment of strategic resources as the main drivers of future organizational success. In SaaS, such strategic resources (patents, brands, content, funnel management, specific vendor agreements, minimum churn, processes that are hard to imitate) are seldom the topic of conversation in management or cost accounting curricula. Cloud-based business models, the subscription economy, the impact of “sunk cost” investment of research, development and marketing expenses, top line focus and extended pathways to profitability are all issues with which future finance and accounting professionals should have more exposure.

We are simply pointing out what our respondents already recognize and are acting on. Traditional accounting has lost touch with today’s business models and the performance metrics that are derived from these models. The SaaS focus is on the discovery and effective management of strategic assets and in utilizing performance metrics that monitor that strategic progress. To quote Michael Dingle, Advisory Partner, PWC Ventures Leader:

“We are in an era in which every company needs to know how it will apply new technology, generate intellectual property, and adapt its business model – an era in which every company is a tech company. It behooves incumbent leaders to ... understand these waves of innovation”³⁷

Such understanding is also critical for the Canadian economy. In an excellent article, politicians Robert Asselin and Sean Speer, write in “A New North Star: Canadian Competitiveness in an Intangibles Economy”:

“Policy makers must become more attuned to the trends of an intangibles economy and, in turn, the extent to which it requires us to adjust, refine, and improve our competitiveness-related policies. The first order of business is to understand what is happening.”³⁸

35 (Lev & Gu, 2016)

36 Examples of their empirical research on the value-add of accounting to investors includes the finding that current financial statements provide a steadily decreasing percentage (currently 5% and dropping), of information used by investors in their funding decisions. They list four key areas where accounting reports have consistently deteriorated in terms of relevant information.

- The deteriorating role of key financial report indicators – sales, cost of sales, SG&A expenses, earnings, assets and liabilities
- The deteriorating timeliness of when financial information is released
- The deteriorating ability of reported earnings to predict future corporate performance
- The deteriorating quality of financial information.

37 (Dingle, 2019)

38 (Asselin & Speer, 2019)

So, what can be done? We do not wish to leave this topic without a look at possible solutions to resolve this relevancy issue. We believe a case can be made for changes in approach at both the college/university level and at the CPA association level. The argument is not a plea to incorporate SaaS metrics into curricula and professional examinations. It is to rethink our approach to how we should teach students and professionals to understand a business model, identify what matters, and then design relevant metrics to support it. One of the study participants made this point succinctly:

“The role of the CFO is to figure out how to value and talk about the businesses in which they are involved or decide to acquire. So, I think regardless of whether SaaS is a disruptor of anything, it all comes back to the basic principle that you need to actually figure out what the key business model and metrics are that are going to drive your company and reshape around that. The general skill of actually thinking about what matters, measuring, reporting, planning and fixing things in a chaotic environment are skills that we need and we’re not going to get away from that.”

One of the roles of university and professional accounting education should be to help future CPAs connect business models with relevant performance management information. A place to start at the university/college level is to recognize that much of our management and cost accounting curricula has been designed for a different time – a time when the economy was dominated by manufacturing and retail operations. Today’s economy increasingly features uniquely different business models. With these models come new approaches to management, measurement and control. University/college faculty and program directors can take a leadership role in getting these curricular changes underway.

However, this is not likely to happen without commensurate changes at the CPA professional level. Universities and colleges are guided by the CPA Competency Map that lays the foundation for the CPA certification program, including education, accreditation, examinations, and practical experience. While there have been periodic updates to the map, it is still weak in the areas described in this White Paper. For example, nowhere in the core and elective modules or in the enabling or technical competencies does the subject of “business models” appear. Yet, the type of business model adopted by an organization drives a great number of the individual competencies described in the 160-page competency document. In the absence of an industry, product/service or business model context, these competency recommendations risk being too generic to be relevant. We argue that CPA should reflect on these observations and consider modifying the Competency Map to incorporate these important additions³⁹.

³⁹ Please refer to the first paragraph of the acknowledgements section on page 47.

APPENDICES

APPENDIX A – THE STUDY’S METHODOLOGY

Our objectives in this White Paper are to (1) provide guidance in the effective use and interpretation of metrics designed for a SaaS-based world; (2) offer advice on best practices and lessons learned to individuals who are, or plan to be, working in SaaS organizations in a finance-based capacity, and (3) provide recommendations to professional bodies and academic institutions regarding educational opportunities surrounding performance metrics of cloud-based businesses.

To accomplish these objectives, the authors drew on previous literature, posts and blogs on SaaS-based models and metrics, a listing of which is included in Appendix C. Information from these sources was used to develop a questionnaire that was used to gather information about organizations, interviewees, key SaaS metrics adopted, purpose, use and timing of metrics, data collection systems and insights of key decision makers that would be helpful to finance and accounting executives in both SaaS-based and SaaS-user organizations.

Rather than use a survey approach which can suffer from low response rates, non-response biases and a lack of detailed input, the research team conducted hour long field interviews to gather rich descriptive evidence from (1) key C-suite personnel in diverse SaaS-based businesses (2) institutional users of SaaS-based products and services (3) directors and mentors involved in accelerators and incubators where many SaaS companies are hatched, and (4) investors who provide seed and venture capital to various levels, at various times, to SaaS companies.

We used contacts in our local business community to identify potential participants for the study. To improve the generalizability of our findings, we sought SaaS companies that varied in size (revenue, number of employees), age, and displayed a diversity in product/service offerings. Finally, prior to publication, we held a ½ day symposium to which all the participants in the study were invited to attend. The symposium gave the researchers the opportunity to highlight the key findings of the study, to allow the attendees to provide additional input and insights that may not have been captured by the study document and to share business practices with one another. We conducted all our interviews and conducted the symposium in a mid-sized metropolitan center in Canada that is well known for its technology, innovation, global reach and SaaS company successes.

All interviews were conducted in-person by at least two of the co-authors at the participating SaaS/institution/investor/incubator premises over a four-month period during 2018/19. Interviews ranged in length from 45 minutes to 90 minutes and averaged about 60 minutes.

Overall, we were satisfied that we had a reasonable sample of respondents and that our interviewees possessed the expertise required to meaningfully reply to our questions. We believe there is sufficient variation in the characteristics of our participating organizations with respect to size, age and operations to make informed observations of key SaaS metrics and their use to assist finance-oriented executives. We also believe that the information imparted, and the quotes received from participants described in Section 3 will be beneficial to any individual or group interested in improving the quality of information being collected and used in SaaS enterprises.

APPENDIX B - AN ILLUSTRATIVE EXAMPLE OF INTEGRATED METRICS

Please see the online spreadsheet at <http://bit.ly/SaaSTemplate>. The URL is case sensitive and you will be redirected to a different location in case you type the internet address in lower case.

Note: depending on the maturity and nature of the SaaS organization, different metrics and manner of metric calculation may be used. However, this represents a good example of an integrated set of SaaS performance metrics. While numbers are fictitious, readers can follow how measures of the various metrics are calculated. There are three different access methods to get the formulas. **Offline access:** use the following figure to look at metrics definition using a color code and formula syntax. **Read-only access:** use the short link on the top of this section to access a read-only Google Sheet named “SaaS Template - SaaS Company - An Illustrative Example of Integrated Metrics” and explore cells’ content using the formula bar. **Full access:** download an Excel copy to your computer to modify the template from the Google Sheet “read-only” version.

SaaS Company - Illustrative Example of Integrated Metrics					
Assumptions:					
Annual Churn % [A-CHURN]	9%				
Gross Margin % [G-MRGN]	80%				
2019					2019
	Q1 - Actual	Q2 - Actual	Q3 - Forecast	Q4 - Forecast	Total
Total New Name ARR Signed in Quarter [NN-ARR-Q]	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 12,000,000
Total New Name MRR Signed in Quarter [NN-MRR-Q]= [NN-ARR-Q]/12	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 1,000,000
Total Upsell ARR Signed in Quarter [TU-ARR-Q]	\$ 400,000	\$ 400,000	\$ 400,000	\$ 400,000	\$ 1,600,000
Total Upsell MRR Signed in Quarter [TU-MRR-Q]= [TU-ARR-Q]/12	\$ 33,333	\$ 33,333	\$ 33,333	\$ 33,333	\$ 133,333
Total ARR Signed in Quarter [T-ARR-Q]= [NN-ARR-Q]+[TU-ARR-Q]	\$ 3,400,000	\$ 3,400,000	\$ 3,400,000	\$ 3,400,000	\$ 13,600,000
Total MRR Signed in Quarter [T-MRR-Q]= [NN-MRR-Q]+[TU-MRR-Q]	\$ 283,333	\$ 283,333	\$ 283,333	\$ 283,333	\$ 1,133,333
Lifetime Value [LTV]					
ARR (New Customers) [ARR] = [NN-ARR-Q]	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000	\$ 12,000,000
# of New Customers [#NC]	24	24	24	24	96
Average ARR New Customer [A-ARR]=[ARR]/[#NC]	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000
License Gross Margin % [LGM]	80%	80%	80%	80%	80%
Average Deal Length (Years) [ADL]	5	5	5	5	5
Churn Rate [A-CHURN]	9%	9%	9%	9%	9%
Lifetime Value Signed in Quarter [LTV-Q]=[ARR]*[LGM]*(1-[A-CHURN])*[ADL]	\$ 10,920,000	\$ 10,920,000	\$ 10,920,000	\$ 10,920,000	\$ 43,680,000
Average Customer Lifetime Value [A-LTV]=[LTV-Q]/[#NC]	\$ 455,000	\$ 455,000	\$ 455,000	\$ 455,000	\$ 455,000
Cost of Acquiring Customers [CAC]					
Sales Salaries [SS]	\$ 800,000	\$ 900,000	\$ 1,000,000	\$ 1,200,000	\$ 3,900,000
Marketing & ODR Salaries [M-ODR-S]	\$ 500,000	\$ 600,000	\$ 600,000	\$ 600,000	\$ 2,300,000
Marketing & ODR Operating Expenses [M-ODR-OE]	\$ 552,600	\$ 683,667	\$ 683,667	\$ 683,667	\$ 2,603,600
Travel & Other Sales Expense [T-OSE]	\$ 378,175	\$ 183,908	\$ 186,908	\$ 291,408	\$ 1,040,400
Commissions On Sales [COMM-S]	\$ 396,446	\$ 748,378	\$ 704,871	\$ 704,871	\$ 2,554,566
[CAC]=[SS]+[M-ODR-S]+[M-ODR-OE]+[T-OSE]+[COMM-S]	\$ 2,627,221	\$ 3,115,953	\$ 3,175,446	\$ 3,479,946	\$ 12,398,566
Magic Number [MGC-N]= [T-ARR-Q]*[LGM]/[CAC]	1.04	0.87	0.86	0.78	0.88
Ideal Range for Magic Number (> 0.7)	> 0.7	> 0.7	> 0.7	> 0.7	> 0.7
Average Cost of Acquiring Customers in Year [A-CAC]=[CAC]/[#NC]	\$ 109,468	\$ 129,831	\$ 132,310	\$ 144,998	\$ 129,152
Ideal Range of Average CAC (\$75k - \$200k)	\$75K - \$200K				
Months To Recover CAC [TR-CAC]=[A-CAC]/([A-ARR]/12*[LGM])	13	16	16	17	15
Ideal Range Months To Recover CAC (<12)	<12	<12	<12	<12	<12
LTV to CAC [LTV-T-CAC]=[A-LTV]/[A-CAC]	4.2	3.5	3.4	3.1	3.5
Ideal Range LTV to CAC (>3x)	3x	3x	3x	3x	3x

APPENDIX C – SAAS READING REFERENCES

ID	RESOURCE CLASSIFICATION	RESOURCE NAME	RESOURCE LINK	DESCRIPTION
1	Benchmark Firms	Opex Engine	https://www.opexengine.com/saas-net-retention-rate-myths/	Performance and operating benchmarking services for companies. Opex Engine releases periodic articles in SaaS metrics.
2	Blog/Internet posting Capital Firms	KeyBanc Capital Markets	https://www.key.com/kco/images/2018_KBCM_SaaS_Survey.pdf	US Based bank with services for individuals and institutions. Through the acquisition of Pacific Crest Securities, the company consolidates survey-based studies for private SaaS companies on an annual basis.
3	Blog/Internet posting Capital Firms	SaaS Capital	https://www.saas-capital.com/research/	SaaS Capital provides non-dilutive funding options for start-ups. It releases periodic SaaS blog articles and research documents.
4	Blog/Internet posting Communities	L-Spark	https://www.l-spark.com/saas18/	L-Spark looks to consolidate Ottawa as the capital of SaaS. L-Spark is led by Leo Lax and it provides investment and partnership opportunities plus articles and other sets of resources to empower SaaS companies.
5	Blog/Internet posting Communities	SaaStr	https://www.saastr.com/	SaaStr is a community of SaaS executives, founders, and entrepreneurs. It provides industry-leading content and community connections.
6	Blog/Internet posting VC Firms	Andreessen Horowitz	https://a16z.com https://a16z.com/2015/08/21/16-metrics/ https://a16z.com/category/enterprise-b2b-saas/	VC firm that publishes podcast and internet articles for various technology topics including “enterprise & SaaS”.
7	Blog/Internet posting VC Firms	Bessemer Venture Partners	https://www.bvp.com/atlas/state-of-the-cloud-2019	BVP is a VC Firm that shares studies and articles through e-mail subscriptions.
8	Blog/Internet posting VC Firms	Open View Partners	https://openviewpartners.com/ https://labs.openviewpartners.com/the-ultimate-saas-funnel-guide/#.XEUMSPx7mgS https://openviewpartners.com/expansion-saas-benchmarks/	OV Blog publishes articles and podcasts on Marketing, sales, product pricing, customer success, finance/operations, HR/Leadership, and other categories. Some SaaS content creators are Anna Talerico, Amanda Nielsen, and Wendy Schott.

9	Blog/Internet posting VC Firms	Y Combinator	https://www.ycombinator.com	Y Combinator provides blogs, podcasts, videos and other resources for companies in a wide range of industries.
10	Blog/Internet posting	Data Box	https://databox.com/blog https://databox.com/metrics-every-saas-company-should-track	Business Analytics company offering SaaS KPIs dashboards. Data Box publishes a variety of blog articles on a daily and weekly basis.
11	Blog/Internet posting	Entrepreneur.com	https://www.entrepreneur.com	The website publishes podcasts, articles, and books discussing different entrepreneurial topics.
12	Blog/Internet posting	For Entrepreneurs	https://www.forentrepreneurs.com/ https://www.forentrepreneurs.com/saas-metrics/ https://www.forentrepreneurs.com/saas-metrics-2/ https://www.forentrepreneurs.com/2018-private-saas-company-survey-part-2/	Numerous blogs and articles by David Skok on SaaS related topics.
13	Blog/Internet posting	Funnel Cake	https://getfunnelcake.com/revops-framework	RevOps framework article. RevOps is intended to drive growth through operational efficiency across the customer lifecycle. Funnelcake offers a sales analytics product for companies.
14	Blog/Internet posting	Greg Head	https://greghead.com/27-awesome-saas-metrics-resources-recurring-revenue-business/	A compilation of 27 resources on SaaS Metrics by Greg Head.
15	Blog/Internet posting	Hubspot	https://blog.hubspot.com/service/saas-metrics https://www.hubspot.com/inbound-marketing	Hubspot offers CRM, Marketing and Sales products and platforms. The company blog offers articles addressing products details and customer needs. One blog article is: "11 Metrics Every SaaS Company Should Care about" by Sophia Bernazzani.
16	Blog/Internet posting	The SaaS CFO	https://www.thesaascfo.com/	The SaaS CFO blog is offered by Ben Murray. He shares his passion for numbers, SaaS/subscription metrics, and forecasting. He shares forecast and SaaS-related spreadsheet models to subscribers.

17	Blog/Internet posting	Tomasz Tunguz	https://tomtunguz.com/	Tomasz Tunguz shares posts in multiple categories ranging from SaaS, Benchmarks, Pricing, Blockchain and recruiting. The site currently holds 206 SaaS articles.
18	Books	Books on SaaS models	The End of Accounting and the Path Forward for Investors and Managers by Baruch Lev And Feng Gu, 2016	Authors show how current financial information and metrics no longer reflect the performance and value of contemporary organizations. This book reports financial documents' continuous deterioration in relevance to investors' decisions.
19	Communities	CFO groups under VC network		
20	Communities	Local group of CFOs		

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ABOUT THE AUTHORS

Howard M. Armitage Ph. D, FCPA, FCMA, Founding Director, Conrad School of Entrepreneurship and Business and former Director and Gordon Cowperthwaite Professor of Accounting, School of Accounting and Finance, University of Waterloo



Gary Pooley, CPA, CA, Former Partner at Ernst and Young, joined the Waterloo Accelerator Centre as CFO for 10+ years. Currently, an advisor to graduates of the AC as well as actively involved in community initiatives such as the Grand River Hospital



Soren Campos, MBET, graduate from University of Waterloo's Conrad School of Entrepreneurship and Business, 2018 Canadian Business Model Competition semi-finalist and former investment analyst at the University of Waterloo Student Venture Fund. Soren has 10+ years of experience in managing Information Technologies in the Financial Industry.



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