



Online-Appendix zu

„Market reactions to the servitization of product offerings - An event study on the software as a service model“

Jaakko Nurkka

Technische Universität München

Junior Management Science 3(2) (2018) 121-150

Appendix

Appendix A – Coding examples for event types

Date	Firm	Event Type	Excerpts from press release (justification for coding in bold)
2012-04-23	Adobe Inc.	Existing software, parallel perpetual offering	<p>"A subscription-based offering, Adobe Creative Cloud is a hub for making, sharing and delivering creative work and it is centered around a powerful release of Adobe Creative Suite® 6 software (see separate release), packed with innovation across its industry-defining design, Web, video and digital imaging tools."</p> <p>"Adobe continues to offer 14 CS6 point-products as well as Adobe Creative Suite 6 Design & Web Premium (US\$1,899), Adobe Creative Suite 6 Design Standard (US\$1,299), Adobe Creative Suite 6 Production Premium (US\$1,899) and Adobe Creative Suite 6 Master Collection (US\$2,599) for purchase."</p>
2015-09-22	Splunk Inc.	New software, parallel perpetual offering	<p>"Splunk Inc. (NASDAQ: SPLK), provider of the leading software platform for real-time Operational Intelligence, today announced Splunk IT Service Intelligence (ITSI). ... This new solution delivers a central, unified view of critical IT services and leverages advanced analytics driven by machine learning to highlight anomalies, detect root cause and pinpoint areas of impact."</p> <p>"Splunk ITSI is in a class of its own because it provides both high-level monitoring and deep-dive troubleshooting and analytics in one solution, available as either software or a cloud service."</p>
2006-05-15	iPass Inc.	Existing software, only available as SaaS	<p>"iPass Inc. (NASDAQ: IPAS) today released a significantly enhanced version of its Endpoint Policy Management service. Now fully Web-enabled, the iPass Endpoint Policy Management solution provides IT departments with the easiest way to enforce corporate security and usage policies on company computers."</p> <p>"The only software installation required is a small agent on each user's remote computer, which protects the device whenever it is connected to any network, regardless of the type of Internet connection."</p> <p>"In addition to being easy to deploy and use, the iPass Endpoint Policy Management solution is also a cost-effective solution in its class. Pricing is a nominal monthly fee, per device that uses the service."</p>
2015-10-13	SAP SE	New software, only available as SaaS	<p>"SAP SE (NYSE: SAP) today unveils the SAP(R) Cloud for Analytics solution, a planned software as a service (SaaS) offering that aims to bring all analytics capabilities into one solution for an unparalleled user experience (UX)."</p> <p>"SAP intends to deliver SAP Cloud for Analytics in a fully scalable, multi-tenant environment at a price point that enables any individual or company to sign up and get going quickly."</p>

Appendix B – Coding examples for variable “partnering”

Date	Firm	Partnering	Excerpts from press release (justification for coding in bold)
2006-10-09	Microstrategy Inc.	Yes	<p>“salesforce.com Dreamforce Conference -- Angel.com, a leading provider of on-demand call center and Interactive Voice Response (IVR) solutions and a division of MicroStrategy(R) Inc. (Nasdaq: MSTR), and salesforce.com (NYSE: CRM), the market and technology leader in on-demand business services, announced the expansion of Angel.com's suite of SalesforceByFone applications today at Dreamforce '06, the salesforce.com User and Developer Conference.”</p> <p>“LeadByFone and RecordByFone by Angel.com are on-demand, speech-enabled Interactive Voice Response (IVR) solutions that make capturing and analyzing client or prospect data more accurate, more efficient and more cost-effective. Built on the AppExchange on-demand platform, LeadByFone and RecordByFone are immediately available for test drive and deployment at http://www.salesforce.com/appexchange.”</p>
2012-07-23	Attunity Ltd.	Yes	<p>"Attunity Ltd. (OTC BB: ATTUD), a leading provider of information availability software solutions, announced today that it has become an Amazon Web Services (AWS) partner and introduced Attunity CloudBeam, a software as a service (SaaS) platform designed to deliver high performance solutions for moving Big Data in, out and across AWS cloud data centers quickly and easily."</p>
2009-01-26	eFuture Information Technology Inc.	Yes	<p>“eFuture Information Technology Inc. (Nasdaq: EFUT) ("eFuture"), a leading provider of software and services in China's retail and consumer goods industries, announced its collaboration with IBM (NYSE: IBM) to launch a Software-as-a-Service ("SaaS") solution for the retail distribution industry in China.”</p> <p>“Our retail software and industry expertise has been taken to the next level following our partnership with IBM's cutting-edge technologies.”</p> <p>“IBM and eFuture began their collaboration since 2005 to develop software for China's retail industry. IBM integrated its SaaS infrastructure platform, designed and developed by IBM China Research Lab, with eFuture's industry solutions. The end-to-end SaaS Solution, running on WebSphere Application Server and DB2 database, is based on IBM's advanced SOA technology.”</p>

Appendix C – Companies and events included in the study

Firm name	Date	Firm name	Date
Accelrys Inc	2014-02-06	Amdocs Limited	2012-02-28
Accenture PLC	2010-03-09	Amdocs Limited	2012-10-29
Accenture PLC	2010-04-12	Amdocs Limited	2013-02-13
Accenture PLC	2012-06-05	Amdocs Limited	2013-04-17
Accenture PLC	2013-11-21	Ansys Inc	2001-11-07
Accenture PLC	2015-03-10	Apple Inc.	2005-06-28
ACI Worldwide, Inc.	2007-02-20	Apple Inc.	2014-05-28
ACI Worldwide, Inc.	2014-04-29	Aspen Technology Inc	2009-07-09
Acxiom Corp	2008-08-25	Asure Software, Inc.	2012-02-07
Acxiom Corp	2008-10-13	Asure Software, Inc.	2012-04-20
Acxiom Corp	2008-11-06	Asure Software, Inc.	2012-06-18
Acxiom Corp	2009-03-09	Asure Software, Inc.	2012-07-17
Acxiom Corp	2010-03-08	Asure Software, Inc.	2015-06-02
Acxiom Corp	2013-04-25	Attunity Ltd.	2012-07-23
Adobe Systems Inc	2001-10-23	Attunity Ltd.	2012-08-28
Adobe Systems Inc	2006-09-18	Attunity Ltd.	2012-10-31
Adobe Systems Inc	2006-11-15	Attunity Ltd.	2012-11-27
Adobe Systems Inc	2007-01-15	Autobytel Inc	2005-03-28
Adobe Systems Inc	2007-04-16	Autodesk Inc	2001-04-04
Adobe Systems Inc	2008-11-17	Autodesk Inc	2001-05-15
Adobe Systems Inc	2009-01-12	Autodesk Inc	2003-09-29
Adobe Systems Inc	2009-01-26	Autodesk Inc	2003-10-16
Adobe Systems Inc	2009-03-05	Autodesk Inc	2006-02-07
Adobe Systems Inc	2009-06-03	Autodesk Inc	2006-03-31
Adobe Systems Inc	2009-06-15	Autodesk Inc	2007-04-10
Adobe Systems Inc	2009-09-21	Autodesk Inc	2007-12-18
Adobe Systems Inc	2009-10-05	Autodesk Inc	2008-08-20
Adobe Systems Inc	2012-04-23	Autodesk Inc	2010-09-30
Adobe Systems Inc	2015-03-17	Autodesk Inc	2015-08-03
Akamai Technologies Inc	2004-10-18	Autodesk Inc	2015-12-01
Akamai Technologies Inc	2009-12-14	Autodesk Inc	2015-12-01
Akamai Technologies Inc	2010-09-27	Autonomy Corporation	2010-01-27
Alcatel-Lucent	2008-04-29	Autonomy Corporation	2011-01-31
Alphabet Inc.	2006-08-28	AVG Technologies NV	2015-03-03
Alphabet Inc.	2007-02-22	AVG Technologies NV	2015-09-30
Alphabet Inc.	2007-07-17	Avnet Inc	2009-04-28
Alphabet Inc.	2008-02-05	Barracuda Networks, Inc.	2014-01-08
Amdocs Limited	2009-06-24	Barracuda Networks, Inc.	2015-08-11

Firm name	Date	Firm name	Date
Barracuda Networks, Inc.	2015-12-16	Citrix Systems Inc	2004-05-17
Blackbaud, Inc.	2008-03-31	Citrix Systems Inc	2008-07-09
BMC Software Inc	2002-08-12	Citrix Systems Inc	2009-02-26
BMC Software Inc	2005-11-08	Citrix Systems Inc	2010-02-24
BMC Software Inc	2006-09-26	Citrix Systems Inc	2011-02-15
BMC Software Inc	2010-01-19	CommTouch Software Ltd.	2010-02-23
BMC Software Inc	2013-02-12	CommTouch Software Ltd.	2014-01-30
Bottomline Technologies Inc	2002-05-20	CommTouch Software Ltd.	2014-05-28
Brightcove, Inc.	2012-06-26	CommTouch Software Ltd.	2015-07-27
Brightcove, Inc.	2012-09-06	CommVault Systems, Inc	2011-08-17
Brightcove, Inc.	2015-10-27	CommVault Systems, Inc	2011-10-18
Broadridge Financial Solutions, Inc.	2009-06-16	Convergys Corp	2009-12-03
Broadridge Financial Solutions, Inc.	2010-10-25	Cornerstone OnDemand, Inc.	2011-10-03
BroadVision Inc	2002-03-27	Cornerstone OnDemand, Inc.	2015-05-12
BroadVision Inc	2007-03-07	Cornerstone OnDemand, Inc.	2015-05-12
BroadVision Inc	2007-08-02	Counterpath Corporation	2011-06-01
BroadVision Inc	2008-01-28	Cvent Inc	2015-04-06
CA, Inc.	2002-03-04	Datawatch Corp	2003-11-10
CA, Inc.	2003-06-02	Datawatch Corp	2014-01-28
CA, Inc.	2003-08-21	Demand Media Inc	2013-08-06
CA, Inc.	2004-05-25	Digimarc Corporation	2010-06-08
CA, Inc.	2008-11-17	DST Systems	2003-09-29
CA, Inc.	2008-11-17	DST Systems	2010-12-07
CA, Inc.	2008-11-17	DST Systems	2011-05-23
CA, Inc.	2009-07-20	Ebix, Inc.	2002-01-21
CA, Inc.	2009-07-29	eFuture Holding Inc.	2007-05-17
CA, Inc.	2009-10-26	eFuture Holding Inc.	2008-04-30
CA, Inc.	2010-04-08	eFuture Holding Inc.	2009-01-26
CA, Inc.	2010-04-13	EMC	2003-05-12
Callidus Software Inc.	2006-04-03	EMC	2004-06-15
Callidus Software Inc.	2011-10-17	EMC	2007-10-04
Callidus Software Inc.	2011-11-02	EMC	2008-01-22
Check Point Software Technologies Limited	2001-06-05	EMC	2009-05-18
Check Point Software Technologies Limited	2006-05-23	EMC	2009-06-24
CheckFree Corporation	2007-10-01	Epicor Software Corporation	2007-06-14
Chordiant Software	2007-08-13	Everyday Health Inc	2015-08-11
Chordiant Software	2007-08-13	Fair Isaac & Company Inc	2012-07-23
Cisco Systems Inc	2009-04-21	Fair Isaac & Company Inc	2012-08-20
Citrix Systems Inc	2003-12-19	Fair Isaac & Company Inc	2012-10-11

Firm name	Date	Firm name	Date
Fair Isaac & Company Inc	2012-12-19	International Business Machines Corp	2009-10-05
Fair Isaac & Company Inc	2013-05-02	International Business Machines Corp	2009-12-08
Fair Isaac & Company Inc	2015-01-29	International Business Machines Corp	2010-03-16
FalconStor Software, Inc.	2008-07-24	International Business Machines Corp	2010-03-31
Fiserv Inc	2013-02-19	International Business Machines Corp	2010-10-05
Fiserv Inc	2013-07-25	International Business Machines Corp	2010-10-14
Fiserv Inc	2014-01-29	International Business Machines Corp	2010-12-08
Fleetmatics Group PLC	2014-04-08	International Business Machines Corp	2011-09-20
Genpact Limited	2015-05-20	International Business Machines Corp	2011-11-11
GoDaddy Inc	2015-10-01	International Business Machines Corp	2011-12-08
Guidance Software, Inc	2008-08-20	International Business Machines Corp	2012-05-22
Hewlett Packard Enterprise Company	2007-10-15	International Business Machines Corp	2013-06-06
Hewlett Packard Enterprise Company	2008-04-07	International Business Machines Corp	2014-01-27
Hewlett Packard Enterprise Company	2008-05-27	International Business Machines Corp	2014-05-13
Hewlett Packard Enterprise Company	2008-06-17	International Business Machines Corp	2014-07-01
Hewlett Packard Enterprise Company	2009-03-31	International Business Machines Corp	2014-09-09
Hortonworks, Inc.	2015-09-28	International Business Machines Corp	2014-11-25
Imperva Inc	2014-08-26	International Business Machines Corp	2014-12-04
Ingram Micro	2007-03-07	International Business Machines Corp	2015-04-21
Ingram Micro	2007-05-07	International Business Machines Corp	2015-08-05
Innovative Software Technologies, Inc.	2002-02-19	International Business Machines Corp	2015-09-15
Intel Corp	2002-03-18	International Business Machines Corp	2015-09-22
Interactive Intelligence Group, Inc.	2006-02-02	International Business Machines Corp	2015-11-25
Interactive Intelligence Group, Inc.	2007-05-08	International Business Machines Corp	2015-12-22
Interactive Intelligence Group, Inc.	2015-01-07	Intralinks Holdings, Inc.	2013-04-16
Interactive Intelligence Group, Inc.	2015-06-09		
InterNAP Corporation	2011-01-18		
International Business Machines Corp	2004-04-21		
International Business Machines Corp	2004-05-27		
International Business Machines Corp	2005-05-25		
International Business Machines Corp	2009-06-23		

Firm name	Date	Firm name	Date
Intralinks Holdings, Inc.	2013-04-29	Microstrategy Inc	2005-02-17
Intralinks Holdings, Inc.	2013-10-16	Microstrategy Inc	2006-05-24
Intuit Inc	2008-04-17	Microstrategy Inc	2006-08-07
iPass Inc.	2006-05-15	Microstrategy Inc	2006-10-09
iPass Inc.	2007-07-10	Microstrategy Inc	2011-01-25
iPass Inc.	2007-12-11	Microstrategy Inc	2011-07-12
j2 Global, Inc.	2004-02-03	Microstrategy Inc	2011-07-12
Jack Henry & Associates	2008-08-13	Microstrategy Inc	2011-09-28
Jack Henry & Associates	2011-06-28	Microstrategy Inc	2012-07-10
Jack Henry & Associates	2011-07-26	Microstrategy Inc	2012-10-31
Jack Henry & Associates	2012-10-09	Microstrategy Inc	2014-01-28
Keynote Systems Inc	2012-12-03	Mitek Systems Inc	2011-07-27
Lionbridge Technologies Inc	2006-04-25	Monotype Imaging Holdings Inc.	2010-05-04
Lionbridge Technologies Inc	2009-10-26	Monotype Imaging Holdings Inc.	2010-09-14
Lionbridge Technologies Inc	2010-04-26	Monotype Imaging Holdings Inc.	2012-09-18
Lionbridge Technologies Inc	2011-02-28	NetSuite Inc	2008-02-28
Lionbridge Technologies Inc	2011-04-12	NetSuite Inc	2008-10-15
LivePerson Inc	2004-09-21	NetSuite Inc	2009-03-19
LivePerson Inc	2006-07-11	NetSuite Inc	2010-04-07
MAM Software Group, Inc.	2012-11-12	Neustar, Inc.	2013-11-14
MAM Software Group, Inc.	2013-09-12	Novell Inc	2010-04-28
MAM Software Group, Inc.	2013-10-08	Novell Inc	2010-08-24
MAM Software Group, Inc.	2014-04-02	Novell Inc	2011-04-05
Microsoft Corp.	2001-05-10	Nuance Communications, Inc.	2007-10-02
Microsoft Corp.	2001-11-12	Nuance Communications, Inc.	2007-10-18
Microsoft Corp.	2002-04-10	Nuance Communications, Inc.	2008-04-08
Microsoft Corp.	2003-09-15	Nuance Communications, Inc.	2008-10-06
Microsoft Corp.	2003-10-14	Nuance Communications, Inc.	2010-07-27
Microsoft Corp.	2005-01-10	Nuance Communications, Inc.	2011-08-02
Microsoft Corp.	2005-01-20	Oracle Corp	2003-06-13
Microsoft Corp.	2006-02-07	Oracle Corp	2006-06-13
Microsoft Corp.	2006-03-30	Oracle Corp	2006-10-19
Microsoft Corp.	2007-01-10	Oracle Corp	2007-04-17
Microsoft Corp.	2008-07-08	Oracle Corp	2008-01-07
Microsoft Corp.	2008-11-17	Oracle Corp	2009-06-30
Microsoft Corp.	2009-03-30	Park City Group, Inc.	2004-04-19
Microsoft Corp.	2010-09-09		
Microsoft Corp.	2011-01-17		
Microsoft Corp.	2014-02-19		

Firm name	Date	Firm name	Date
Paychex Inc	2008-10-08	Smith Micro Software Inc	2015-04-09
Paychex Inc	2013-06-12	Sonic Foundry Inc	2001-12-11
Paychex Inc	2014-10-08	Sonic Foundry Inc	2007-07-23
Paycom Software Inc	2015-06-22	Sonic Foundry Inc	2015-03-31
Pegasystems Inc	2008-10-02	Splunk Inc.	2012-08-28
Pegasystems Inc	2009-05-19	Splunk Inc.	2013-10-01
Progress Software Corp	2012-11-06	Splunk Inc.	2015-03-10
PTC Inc.	2004-11-10	Splunk Inc.	2015-09-22
PTC Inc.	2015-01-28	SunGard Data Systems Inc	2003-11-18
QAD Inc	2007-08-22	Synopsys Inc	2014-09-29
QAD Inc	2013-04-15	Tableau Software, Inc.	2013-07-18
QAD Inc	2013-09-23	TechTarget Inc	2014-03-19
Qlik Technologies Inc	2015-04-27	TeleTech Holdings Inc	2004-11-04
Quest Software Inc	2009-11-17	TeleTech Holdings Inc	2005-04-14
Quest Software Inc	2011-05-16	TeleTech Holdings Inc	2014-11-12
RealPage Inc	2011-09-12	Teradata Corporation	2009-10-19
RealPage Inc	2012-02-09	Teradata Corporation	2013-10-21
RealPage Inc	2012-04-24	Teradata Corporation	2014-10-09
Red Hat Inc	2007-06-13	The Reynolds and Reynolds Company	2004-04-19
Red Hat Inc	2007-11-07	Tucows Inc.	2002-08-13
Rediff.com India Limited	2002-03-06	Tucows Inc.	2007-05-23
Rovi Corp.	2014-01-07	Ultimate Software Group Inc	2011-10-03
SAP AG	2004-10-27	Unisys Corp	2010-07-22
SAP AG	2010-02-23	Unisys Corp	2010-11-03
SAP AG	2010-02-24	Unisys Corp	2011-02-10
SAP AG	2015-10-13	Unisys Corp	2012-06-26
Sapiens International Corporation N.V.	2008-05-30	Unisys Corp	2013-08-21
SciQuest, Inc.	2012-05-09	Unisys Corp	2014-04-02
Seagate Technology Public Limited Company	2007-09-24	United Online	2005-11-03
Seagate Technology Public Limited Company	2008-11-12	Upland Software, Inc.	2014-11-21
Selectica	2005-09-07	VASCO Data Security International Inc	2008-11-06
Selectica	2005-11-08	VASCO Data Security International Inc	2010-02-18
ServiceSource International, Inc.	2012-09-25	VASCO Data Security International Inc	2010-10-28
Sify Technologies Limited	2007-08-22	Wipro Limited	2009-05-19
Sify Technologies Limited	2010-02-17	Zillow Group, Inc.	2012-05-31
Sify Technologies Limited	2010-05-20	Zix Corporation	2003-02-05
Smith Micro Software Inc	2004-02-17		
Smith Micro Software Inc	2011-05-09		

Appendix D – Proposal for a practitioner journal

On the 23rd of April, 2012, Adobe Inc. launched a Software-as-a-Service subscription offering for its key product line, the Creative Suite. The following year, Adobe's net income had plummeted by almost 35% percent following an 8-percent-drop in revenues. However, 4 years later in April 2016, Adobe's stock price had nearly tripled its value compared to the level in April 2012. Clearly then, the Software-as-a-Service business model⁵ provides a promise of additional value creation that shines at the end of the tunnel for firms looking to transform their business model from selling products to provisioning them as a service. However, companies need to overcome initial challenges when moving to become a service provider, which relate to the scale needed to be successful with SaaS, organizing and incentivizing the salesforce and customer adoption. My study of stock market reactions to 341 similar announcements of new SaaS offerings between 2001 and 2015 shows that companies that are mindful of the challenges and bring SaaS offerings to the market with new product launches, experimenting with parallel business models enter partnerships with specialized infrastructure and platform service providers like IBM, Salesforce or Amazon Web Services are seen to promise the most potential for value creation. I propose discussing the importance of these findings through case studies of software vendors, both successful and unsuccessful ones. The article can help decision makers at companies within and beyond the software industry understand how they should approach the goal of moving downstream in the value chain through "everything as a service" offerings and how investors perceive their strategy of transforming their business model.

	New product launch	Existing product to SaaS
Only SaaS	Dynatrace (Ruxit)	Failure: SAP Business ByDesign
Parallel perpetual offering	Success: Splunk (IT Service Intelligence)	Success: Autodesk (AutoCAD)

⁵ Software as a service comprises two aspects: a technical aspect, meaning that software is hosted “in the cloud” either in a single-tenant or a multi-tenant implementation and a business model aspect, meaning that software is provisioned as a service, where the customer pays a subscription for the use of the software or for the value gained from using the software.

The challenge of parallel business models

Running two business models in parallel comes with numerous challenges. First, there is the problem of perpetual licensing model prohibiting the growth of the SaaS model, stopping it from reaching the economies of scale it direly needs to be successful. If companies do not invest enough in growing the SaaS business, it can never reach the scale needed for it to be successful. And if the SaaS model does not grow, companies lose interest in investing in it, leading to a vicious cycle. Second, there is the problem of incentivizing and organizing the salesforce. Sales personnel that are used to making large license plus maintenance deals are not likely to do well or be motivated to sell smaller monthly or yearly subscription packages. This can also prohibit the SaaS model from reaching the scale it needs. Third, running the two business models in parallel leads to duplication of resources. Software development, operations and support have to be provided for both offerings and because they can differ from one another considerably, economies of scale cannot be reached in the way possible with just one business model.

The reason companies like Splunk and Autodesk go through the hassle of running two business models on parallel is simple - they want to let their customers choose how they deploy and consume the software. Many believe that the SaaS model provides an alternative for customers that previously would not be able to afford the software, opening-up the long tail market for the provider. At the same time, the customers who want to own and operate their software themselves, should be allowed to continue doing so. Many enterprises have large infrastructure and workforce in place to operate software themselves, making a rapid transformation to the SaaS model an unthinkable option. This is why a pure SaaS offering would risk the provider losing some of its customers through the transformation. Based on the results of this study, it seems that investors appreciate the parallel value creation potential of the SaaS and perpetual license sales models and value the flexibility offered to customers over the costs and challenges.

For new product lines, the customer adoption challenge should be less significant, as no customer base is in place for the product that might be lost with a pure SaaS offering. However, my study shows that even for new product launches, investors value a parallel perpetual offering over pure SaaS offerings. This could mean that investors think that providers lose market potential if the software is offered only with the SaaS model and that this loss of market potential overweighs the costs and challenges of parallel models.

SAP Business ByDesign - a failed try at transforming an existing product line to the SaaS model

SAP, seeing the growth of the SaaS enterprise software, launched their own SaaS offering, Business ByDesign, in September 2007. The offering was based on the R/3 ERP software, which they re-engineered for a SaaS offering that they hoped would help them win over new customers in the SMB segment. However, this offering did not take off at all, with Business ByDesign lacking the usability and cost advantages of "born in the cloud" offerings of competitors and the functionality of perpetual software offerings like the R/3. To date, Business ByDesign has not fulfilled its expectations, with the offering plateauing at around 1000 customers.

This example shows how difficult transforming existing products into a pure SaaS offering can be. Not only do companies have to deal with the expectations of customers around the flexibility and cost-efficiency of the SaaS model, but also with the expectations set for the product in place. This often leads to failed re-engineering efforts that generate products that cannot compete with competitive pure SaaS offerings or indeed the existing perpetual software products.

Dynatrace Ruxit - venturing into SaaS through a new pure SaaS product line

Dynatrace, the market leader in Application Performance Management (APM) (source: Garnet), has seen new types of competitors emerge in New Relic and AppDynamics, who embrace the SaaS business model and function fully in the Cloud. This new segment focuses on the monitoring of cloud applications and cover new functionalities compared to Dynatrace's traditional offerings. To address this market and counter the offerings of new competitors, Dynatrace created a new, fully independent subsidiary, Ruxit, to develop and operate cloud application monitoring. Like most of the competitors, Ruxit operates only in the SaaS subscription model. In my study, I found that this strategy of creating new products purely for the SaaS model is the most common strategy among software vendors transforming from perpetual license sales to SaaS. However, the manner in which Dynatrace have taken the step by creating an internal startup that focuses purely on the development, operations and distribution of a pure SaaS product is fairly unique.

Dynatrace Ruxit is clearly betting on a future where all software is provisioned as a service. Based on my study, not offering the product in the traditional perpetual licensing model might

lead to them losing market potential at least in the short term and it remains to be seen whether the strategy brings Ruxit success. Also, Dynatrace as the mother firm still very much focuses on perpetual software license sales, and it will be a challenge to integrate the innovation made by Ruxit into the whole enterprise.

Autodesk - gradual introduction of SaaS offerings for existing product lines

The strategy taken by Autodesk, the market leader in Computer Aided Design & Engineering (CAD, CAE) software, represents a more conservative approach to the transformation from a perpetual software sales model to the SaaS model. Autodesk recognized a need for more flexible software licensing models early, and in 2001 they introduced a subscription licensing model for most products. Since then, the company has started to strongly transform their business and has brought to market fully cloud hosted versions of existing products like the AutoCAD 360, Fusion 360 and PLM 360, which are offered in parallel to the on premise deployed, perpetually licensed versions of the software. This means that the company is running two business models in parallel for multiple products.

The parallel approach seems to have paid off thus far, as the Autodesk share price has increased six fold since the launch of the first subscription offering in 2001. SaaS revenues still only represent a small percentage of total revenues for Autodesk, and only 16 % total recurring revenue comes from the SaaS model, with the rest coming in from traditional maintenance contracts. The pace of change is impressive, however, as the SaaS revenues grew 94 % YoY in fiscal year 2016 for Autodesk, while traditional maintenance revenues only grew 7 %.

Interestingly, after 15 years of transition from perpetual license sales to more flexible subscription programs, Autodesk announced in April 2015 that it would discontinue perpetual license sales of most software products altogether in February 2016. I were able to analyze the stock market reaction to this announcement, which was strongly positive. The example of Autodesk indicates support for the findings of my study that parallel perpetual offerings can lead to more value generation than destruction when companies introduce SaaS products, but it also hints that in the long term the SaaS model should be the only business model software vendors run.

Quote from Autodesk 2016 10-K Annual report (just put it here for interest):

"Autodesk is undergoing a business model transition in which the company will discontinue selling new perpetual licenses in favor of subscriptions and flexible license arrangements. During the transition, billings, revenue, gross margin, operating margin, EPS, deferred revenue, and cash flow from operations will be impacted as more revenue is recognized ratably rather than up front and as new offerings bring a wider variety of price points. Over time, I expect our business model transition to expand our customer base by eliminating higher up-front licensing costs and provide more flexibility in how customers gain access to and pay for our products. In the future, I expect this business model transition will increase our long-term revenue growth rate by increasing total subscriptions, ARR, and customer value over time."

The Splunk way - balancing between SaaS and perpetual software licensing models

Splunk was named as a leader for three years running in the Gartner Magic Quadrant for Security Information and Event Management (SIEM). The company focuses on software that collects and analyzes high volumes of machine-generated data. The interesting thing about Splunk is that even though the company was only founded 13 years ago, its growth has not been based on Cloud computing or the SaaS model like many other 21st century software firms like LinkedIn, Salesforce and Workday. On the contrary, Splunk started its way to the Cloud only in 2011 with the launch of the Splunk Storm offering. Since that day, Splunk has slowly been transforming towards the SaaS model with a parallel business model approach. Even the new product lines that Splunk has launched since then, like IT Service Intelligence - launched in September 2015, are available with both the SaaS and perpetual license sales models.

My study shows that investors believe this is the strategy that promises the most value creation and the success of Splunk seems to underline this. In fact, Splunk's share price has doubled its value since 2012 when it was listed in NASDAQ. The parallel business models seem to work in great harmony at Splunk, with the license business growing at a rate of 44 % YoY and the recurring revenue business growing at 57 % YoY in fiscal year 2016. In 2016, recurring revenue represented 40 % of total revenues from Splunk (compare to 54 % for Autodesk in 2016).

When looking at the case of Splunk, it seems that certain synergies can exist between the two business models. On one hand, a SaaS offering might make the software vendor look more innovative and forward-looking in the eyes of customers, making them more willing to commit to the vendor's products also with perpetual licenses and on premise deployments. At the same time, the SaaS offering in the cloud can offer them a future prospect of transforming the

applications they consume to the cloud without having to change the software they use. On the other hand, the perpetual offering allows the enterprise to make use of the IT resources it has already committed itself to while slowly transforming workloads to a SaaS model.

Zynga’s journey from the cloud to home and back again – why partnering helps make the SaaS model successful

When software firms think about cloud infrastructure, a hot word on their lips seems to be “lock-in”. Just like companies in other industries, software vendors want to remain independent from external service providers in the creation of their value proposition. Cloud infrastructure (IaaS) and platform as a service (PaaS) providers are often seen as threats for lock-in as once the software deployments run on the platform and/or infrastructure, the cost of moving them somewhere else can be high.

In 2009, Zynga, a game developer and operator in a SaaS model decided to move away from Amazon Web Services (AWS) and build its own data centers to handle the storage and computing needs of its games. This was supposed to reduce the costs of operating the software and would reduce Zynga’s dependencies from external parties. The company invested \$ 100 million to build the data centers, only to revert its decision in 2015 and move all workloads back to AWS.

Building SaaS solutions on Cloud infrastructure and application environment providers’ platforms makes sense economically. My study found that investors increase their valuation of the software vendor if the announcement clarifies a cooperation with such a partner.