STRATEGIC ANALYSIS
OF THE
ENTERPRISE MOBILE DEVICE MANAGEMENT SOFTWARE INDUSTRY

by

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Abstract

This paper analyzes the enterprise mobile device management industry and evaluates three strategic alternatives by which an established computer systems management software manufacturing company can enter this industry. The analysis of the three strategic alternatives to build, buy or partner in order to bring to market an enterprise mobile device management product offering delves into an examination of the company's existing position and performance; conducts an external analysis of the enterprise mobile device management industry by exploring key competitors, customer segments, sources of advantage, and analysis of the Five Forces; evaluates relative positions of determined strategic alternatives, and probes their respective feasibility. The project concludes by recommending the option of a non-equity-based licensing alliance with an established pure-play enterprise mobile device management software manufacturer and identifies three potential partner candidates for further technical evaluation.

Keywords: mobile device management, enterprise mobility, BYOD

Executive Summary

An established computer systems management software company faces increased demand from its current customer base to offer enterprise mobile device management capabilities within its product portfolio.

The enterprise mobile device management industry is evolving very quickly under the influence of increasingly accelerating proliferation of smartphones and tablet computers in the workplace. Previously unchallenged industry leaders have rapidly lost market share to new pure-play industry entrants, cultivating a fertile ground for an active M&A landscape.

Although the mobile device management industry is not new and originally emerged as an independent industry of software solutions to remotely provision, manage, and secure access to mobile devices such as smartphones, handheld terminals and tablet computers, the industry is being rapidly consolidated into the general computer systems lifecycle management software industry. Modern customers expect to be able to manage mobile devices and regular computers through the same set of tools and a single pane of glass.

In order to remain competitive in the marketplace, the company will evaluate SDK and API offerings from the three leading pure-play enterprise mobile device management software manufacturers AirWatch, Good Technology and MobileIron. The recommendation to enter the new industry through a non-equity alliance-based technology licensing agreement is the only viable strategic option that aligns with the company's preferences, capabilities and resources.

Table of Contents

List of Figures

List of Tables

Glossary

APAC   Asia-Pacific

API   Application Program Interface

BES   BlackBerry Enterprise Server

BIOS   Basic Input / Output System

BYOD   Bring Your Own Device

CAGR   Compound Annual Growth Rate

CSI   Customer Satisfaction Index

DPA   Data Protection Act

EMEA   Europe / Middle East / Africa

EMR   Electronic Medical Record

IMAP   Internet Message Access Protocol

ISV   Independent Software Vendor

LAR   Large Account Reseller

LTE   Long Term Evolution

MDM   Mobile Device Management

OEM   Original Equipment Manufacturer

POP   Post Office Protocol

QA   Quality Assurance

R&D   Research and Development

SaaS   Software as a Service

SI   Systems Integrator

SLA   Service Level Agreement

SME   Small to Medium Enterprise

SMTP   Simple Mail Transfer Protocol

SWOT   Strengths / Weaknesses / Opportunities / Threats

TEM   Telecom Expense Management

URL   Uniform Resource Locator

VAR   Value Added Reseller

1: Introduction

The proliferation of mobile devices in our personal and professional lives is growing at an unprecedented pace. Although the very first mobile devices, if we consider handheld radio transceivers as such mobile devices, appeared during the Second World War (1941) (H.S.Magnuski, 2005), the modern era of mobile devices started in early 2000 with mass adoption of smartphones and an explosion of applications created for multiple smartphone platforms.

The personal computer industry landscape is rapidly changing under the pressure of the widely adopted use of mobile devices. Such industry trends as cloud computing and Bring Your Own Device (BYOD) change the way personal computers are used in our personal and professional environments. Such tectonic shifts bring a cohort of implications for company and personal data security, personnel productivity and information technology management. In addition to numerous changes in the existing information technology paradigm, the proliferation of mobile devices brings great opportunities for companies willing to address this emergent trend, and the risk of obsolescence for those that are not.

This project will evaluate a number of alternatives for a software company that specializes in packaged software for desktop computers to enter the market of mobile device management software solutions, and put forward a recommendation for the creation of a mobile device management offering through a licensing agreement with a pure-play enterprise MDM solution software manufacturer. The recommendation is based on a situational examination of the company's existing position and performance, an external analysis, an evaluation of multiple strategic alternatives and a feasibility study.

The next chapter outlines the analysis of current situation, the company's present performance, existing problems and shortcomings, and its overall strategic position. The third chapter is devoted to external analysis and explores the industry, present competitors and their relative position, delves into customer segmentation, identifies sources of advantage, and presents the Five Forces analysis. The fourth chapter evaluates a number of potential alternatives, leading to a comprehensive feasibility analysis and identification of a preferred alternative in chapter five. The sixth chapter is the final chapter and details the final recommendation of creating a mobile device management solution offering through a licensing agreement with a pure-play MDM software solutions manufacturer.

2: Situation Analysis

The company is a privately held software development company headquartered in Vancouver, BC, Canada. It competes in a niche industry of software applications designed to control configuration changes within Windows and Macintosh operating systems. The industry of such system utilities represents a smaller niche of the $216.4B software applications segment of the $509B software industry (Bartels, 2011). Company profits and sales have slowed significantly over the past five years. In an attempt to accelerate growth and diversify its product portfolio, the company has created and launched a number of new products, all of which have failed to deliver on the expectation to balance the revenue streams from either the product portfolio or customer segments.

The main revenue-generating product is entering a declining stage of the product life cycle, while other portfolio components fail to compensate for the revenue attrition.

The company's customers are actively adopting mobile devices and cloud technologies, and reducing the number of desktop computers that they use, which, in turn, leads to a reduction of the potential market size for the company's main product, which operates primarily on desktop computers. If the company continues to neglect the trend of its customers operating mobile devices and reducing the number of desktop computers, the company will continue to experience further decline in revenues and market share.

However, creating a new product offering is something the company has attempted to do in the past, and the negative experience, complemented by a significant investment, makes the choice of launching yet another product on an unfamiliar platform of mobile devices that much more challenging.

2.1   Company Overview

The company was established in 1993 and at that time specialized in acquiring computer parts in Asia, assembling them into personal computers, and selling these computers to local small businesses and individual consumers. After its incorporation in 1996, a brief period of moderate growth followed, but the company began to suffer a gradual decline in sales and margin attrition soon thereafter. In 1999 the company switched to manufacturing packaged software through a merger with a software company, effectively abandoning the hardware business completely. The software product quickly turned out to be extremely popular with the target customer demographic of public education institutions. Such customers were already using a hardware-based solution to address their computer configuration recovery needs, but the new product from the company offered a software-based solution that no longer required physical access to the computer's internal components. Company sales exploded first in Canada, and the dedicated efforts of a telemarketing team brought success in the US market soon after.

Currently the company employs 115 people in three offices located in Canada, the United States and the UK. The product portfolio consists of five main categories: reboot to restore, application control, anti-virus, classroom management and computer energy management. Since 1999 the company has sold over 10M licenses to over 30,000 customers in more than150 countries. Seventy-five percent of the company's revenues come from a single flagship product for computer system recovery. Eighty percent of the company's revenues originate in a specific customer vertical segment consisting of education institutions.

2.2   Current Strategic Position

Organizations compete by either exploiting their advantage on the cost side, thus being able to sustainably offer a lower price, or by employing a differentiation strategy through creating added value that customers are willing to pay a premium for. Companies competing on price need

to maintain the least acceptable level of product quality to be able to attract new customers and sustain existing ones. Differentiators need to watch their cost structure while maintaining premium quality, as investment in differentiation might result in complete evaporation of the rents an organization strives on. Organizations often pursue mixed strategies when competing in a marketplace; the choice to differentiate or cost-lead might be specific to a certain product line or customer segment. The company is no exception in this case; Table 1 below illustrates which strategy is being pursued in a specific vertical market with particular product lines.

Table 1 – Differentiation or Low-Cost Strategy by Product Line.

	Education	Government	SME	Large Enterprise
Reboot to Restore	Differentiation	Differentiation	Low Cost	Low Cost
Application Control	Low Cost	Low Cost	Low Cost	Low Cost
Anti-Virus	Differentiation	Differentiation	Low Cost	Low Cost
PC Energy Management	Low Cost	Low Cost	Low Cost	Low Cost
Classroom Management	Differentiation	Low Cost	N/A	N/A

The company offers five distinct product lines, and the degree to which the company focuses on each product varies significantly. Having five different product lines creates a number of operational challenges in terms of product portfolio management and alignment. The decision to play on five fields leads to the necessity of competing with multiple vendors, often on more than one field. The competitive landscape and respective core focus areas are depicted in greater detail in Table 2.

Table 2 - Competitive Landscape and Focus Areas.

	Company	Microsoft	Lumension	Centurion Technologies	McAfee	Fortress Grand	NetOp	HP	AB Tutor	StoneWare	Wimba	Avast	AVG	Avira	Bitdefender	ESET	Fsecure	Kaspersky	Sophos	Symantec	Trend Micro	Verdiem	1E	IBM (BigFix)	Verismic	AVOB	Bit9	Savant Protection
Reboot to Restore	⊠	⧄		■		⊠																						
Application Control	⧄	⊠			⧄	⊠																					■	■
Anti-Virus	⊠	⧄		■	■							■	■	■	■	■	■	■	■	■	■							
Energy Management	⊠	⊠	⧄																			■	■		⧄	■		
Classroom Management	⧄					■		⧄	■	■	■																	
MDM	⧄	⧄			⧄			⧄		⧄		⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄			⊠				
Infrastructure		■	■					■			⊠													■				

Legend:
Core Focus ■
Significant Focus ⊠
Limited Focus ⧄
No Focus ☐

Customer satisfaction and confidence in quality of products are deeply embedded within the organizational ethos of the company and are being actively championed by the CEO and the COO, who originally founded the company and continue to head the executive management. Great customer service, industry leading SLAs, regular customer satisfaction surveys and a continuously monitored customer satisfaction index (SCI) contribute to maintain greater customer satisfaction, translating in the customer's ability to derive more value from the company's products.

A free and open evaluation model allows prospective customers to try the company's products for 30 days without any functional limitations before buying, setting clear expectations and allowing prospects to start consumption of product benefits during the evaluation period and before any investment is made.

A long history of significant investment in research and development (R&D) brought about optimized business processes for meticulous quality assurance, coordinated offshore outsourcing and established Original Equipment Manufacturer (OEM) relationships that have

culminated in greater product performance, further enhancing customer value. This great

performance has a tradeoff in the form of increased costs.

The distribution model is hybrid. The company began with a direct sales force, which

grew organically until it became apparent that further development of the direct sales force was

uneconomical. In order to scale future sales activity, the company began to cultivate a wide

network of channel partners. The e-commerce platform represents an insignificant sales channel,

responsible for approximately 3% of company revenues. Currently, the revenue split between

direct sales and channel sales is equal. A detailed value chain is presented in Figure 1 below.
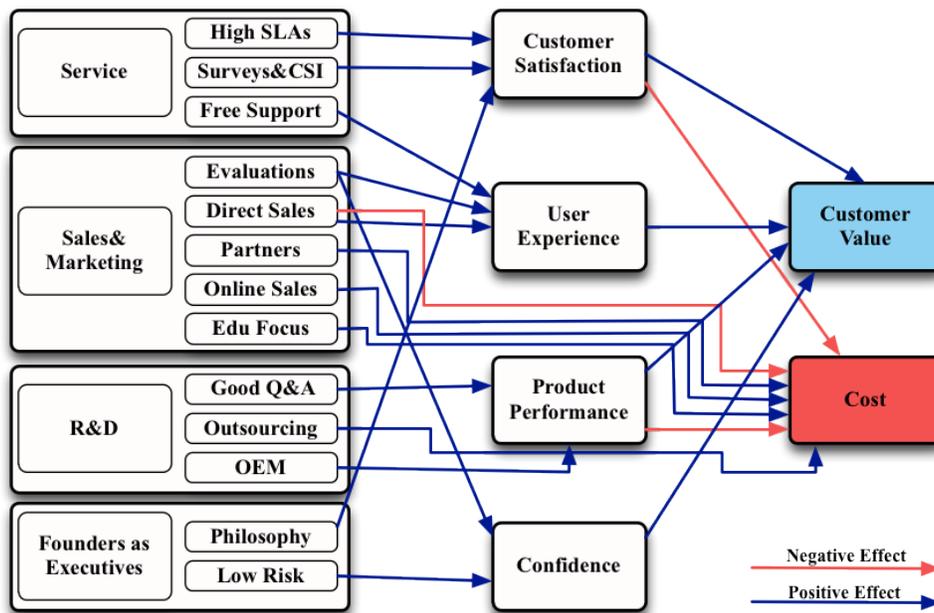
Figure 1 - Company value chain.

The company's history has played a significant role in its operational model and

organizational structure; it maintains a heavy focus on the sales and marketing functions in

contrast to, but not necessarily to the detriment of, research and development. Both functions

employ 78% of the company's employees. Fifty-four percent of company employees reside in

sales and 24% in R&D. The remaining 22% support either the development or the sales function.

Figure 2 below vividly depicts the heavy focus on the sales and marketing function. The size of

the bubble represents the budget for the most recent fiscal year, making it apparent that sales and marketing functions represent the main focus of the company.
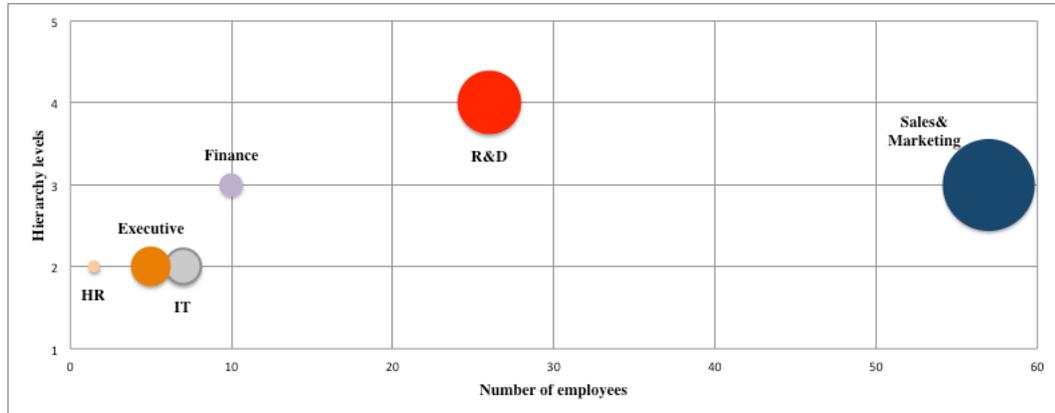
Figure 2 - Company hierarchy and functional areas by number of employees and budget.

High R&D investment and core company values rooted in great customer service and championed by founders who are still active in executive management bring about high product quality, feeding into increased customer satisfaction and thus greater customer value.

Figure 3 demonstrates the company's position diagram in greater detail.
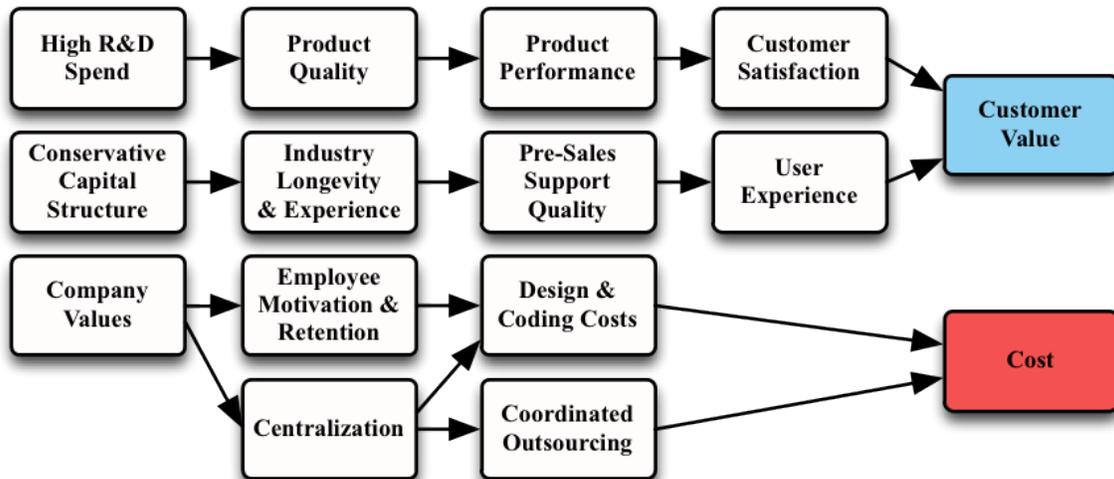
Figure 3 - Company position diagram.

2.3   Current Performance

At present the company is in dire need of a reactive change as its performance has significantly slowed down and further stagnation will have pernicious consequences. Revenue growth has stagnated and dropped to below 5%. With flat sales expenses continue to grow, considerably reducing the amount of working capital. Although still profitable, the company must dramatically improve its performance immediately to avoid losses in the future.

2.4   Current Issues and Problems

The company is privately held and therefore enjoys a greater degree of operational freedom. All retained earnings are distributed as dividends at the end of each fiscal year, which dramatically reduces the amount of working capital.

The financial management practice is very conservative; the company does not utilize any debt instruments and pretty much bootstraps its growth. This financial management tradition combined with the dividend distribution program makes a strategic acquisition unlikely and reduces company's attractiveness to get acquired.

In addition to operational finance challenges, the company's product portfolio is performing poorly. The company has survived the period of explosive growth of its reboot-to-restore product, and launched a number of products that were intended to cater to existing customers and address their other computer management challenges. Such products were intended to integrate well with the other solutions available from the company, and to create an environment where the company's customers who own multiple products would get greater benefits than the individual benefits provided by each product if acquired from non-integrating vendors. None of the product portfolio additions achieved comparable sales volumes, yet they contributed negatively to costs and complexity of operations. The products have not achieved the level of planned integration and often cater to different target personas, reducing intended

complementarity benefits. The lower quality of some of the new products has also had a negative impact on the company's brand.

After a number of years characterized by the continual growth of operational expenses and lack of sales growth, in 2010 the executive management recruited a chief strategy officer to reevaluate organizational direction, create a strategy for significant and sustainable growth, and execute governance over implementation of that strategy. This initiative resulted in the creation of a comprehensive strategic plan for the next five years. The following mission statement was articulated:

> Our company leads through proactive innovation and delivers best of breed intelligent software solutions that focus on the evolving needs of our customers. Our company is fueled by the feedback and support gained from our valued customers, stakeholders and partners, which in turn drive our pioneering spirit and culture.

The following company values were identified and put forward:

- We welcome opportunities and conquer challenges.
- We employ customer-focused initiatives to deliver absolute satisfaction.
- We foster growth through leadership and partnerships.
- We are proudly committed to ethical conduct and social responsibility.
- We care.

The newly created vision statement represented a significant departure from the status quo and current focus on the education market:

> Grow [Company] SMB and Education revenue to $50 million by 2015 while achieving annual EBITDA of 30% by selling complementary software solutions that solve security and operational challenges through multiple sales channels.

> To achieve this vision, the following strategic imperatives have been established:

> 1. Build a culture that values people, teamwork, sustainability and shared success.

2. Focus our operations on efficiency, profitability and customer satisfaction.
3. Create products that are easy to use and deliver significant value.
4. Acquire additional customers in existing and new markets.
5. Maximize the lifetime value of the customer.
6. Go to market with aligned and effective sales channels.

The six strategic imperatives were broken down into 48 individual objectives and assigned to specific executives depending on domain and scope of a particular objective.

After all objectives had been formulated and entered the execution stage, the Chief Strategy Officer, due to CEO duality and the high degree of centralization, was not given enough organizational authority to govern the execution of objectives requiring significant operational changes or financial investment. Without adequate authority and investment and business process changes, the execution of the strategic plan lost the high priority it had briefly enjoyed, and was gradually abandoned.

Having all its resources consumed by a misaligned and poorly performing product portfolio, and competition in multiple product lines, the company became distracted by a failed and resource-intensive strategy definition exercise. It was unable to catch up with the new technological trends of proliferation of mobile devices and cloud computing, and the company also failed to timely address customer product feedback and requests to extend its computer systems management capabilities beyond desktop computers and servers to mobile devices.

In order to remain competitive in the marketplace, acquire new customers and keep existing ones, the company identified the need to enter the industry of enterprise mobile device management software solutions and augment its product portfolio with MDM capabilities.

A recently conducted survey by *Information Week* vividly presents the potential scope of centrally controlled enterprise MDM functionalities that such a product portfolio addition will need to incorporate.

Popularity of MDM Features

Feature	%
Compliance & Policy Setting	53%
Policy Enforcement	51%
Device Updates	44%
Management of Physical Devices	40%
Auditing	34%
Remote selctive data wipe	34%
Remote full data wipe	30%
Support for multiple device types	29%
Over-The-Air Provisioning & Updates	26%
Application white-listing	21%
Remote Troubleshooting	20%
Jailbreak & Rooting Detection	18%
Schedule Bakcup & Restore	11%
Vulnerability Remediation	11%
Role-Based Policies	9%
Private App Store	8%
Sandboxing Capabilities	8%
RSS & Web Browsing	5%

*Figure 4 - Popularity of MDM features as indicated in August 2011 InformationWeek survey (InformationWeek, 2011).*

Note: Five responses allowed. N=323.

The purpose of this research is to evaluate a number of strategic alternatives for the company to enter the space of enterprise mobile device management software solutions, so that it can continue to service its existing clients effectively and also acquire new customers.

3: External Analysis

3.1 Industry Overview

3.1.1 Industry Definition

This paper analyzes the global industry of enterprise mobile device management (MDM) software solutions. The term MDM refers to a software solution for remotely provisioning, managing, and securing access to company-owned and employee-liable (Bring Your Own Device or BYOD) mobile devices such as mobile phones, smartphones, handheld terminals and tablet computers in an organizational environment. Solutions that manage individual consumer devices are excluded from this industry definition.

3.1.2 Industry History

The MDM industry is not new. It emerged in the 1990s when the first mobile devices entered the enterprise world in the form of mobile payment terminals and handheld computers. The software solution components for managing such devices were typically delivered as complimentary offerings accompanying the original manufacturer's hardware.

In June 1999, Research in Motion, a Waterloo, Canada-based company released to the general public version 1.6 of its BlackBerry Enterprise Server MDM solution, which quickly gained popularity in the enterprise landscape for its email and policy management capabilities (itrezzo, 2011).

Another early player in the MDM space also comes from Waterloo, Canada. Watcom International Corporation through a series of acquisitions became Sybase iAnywhere, and ended up under the corporate umbrella of SAP AG through an acquisition of Sybase by SAP in July 2010. Sybase iAnywhere has specialized in mobile device management middleware and

databases since 1996, dominating the industry of mobile databases and middleware in the early 2000s (Sybase Inc., 2012).

Until 2010 the industry of enterprise MDM had a clear leader represented by BlackBerry, with its BlackBerry Enterprise Server (BES), which provided over 550 configuration settings to manage mobile BlackBerry devices, making the company a de facto golden standard of MDM in an enterprise. A series of network outages and proliferation of iOS and Android OS-based devices in an enterprise created an opportunity for independent software manufacturers to create MDM solutions that could compete with BlackBerry's BES functionality when managing non-BlackBerry devices, reinvigorating the industry and ending BlackBerry's monopoly. Industry analyst Gartner observed over 60 individual MDM solution providers in its Magic Quadrant research published in April 2011 (Redman, Girard, & Leif-Olof, 2011).

The development of the enterprise MDM solutions is intricately interwoven with the evolution of mobile communication devices and advancements in wireless data exchange technologies. Table 3 below presents a chronological overview of key events that have shaped the MDM industry.

Table 3 - Key Events That Have Shaped the MDM Industry.

Year	Event
1908	Kentucky melon farmer Nathan B. Stubblefield is granted US patent 887,357 for Wireless Telephone technology (Stubblefield, 1908).
1921	Initial usage of mobile radio devices started. The Detroit Police Department installs 2MHz mobile radios in squad cars (Honan, 2011).
1926	Radiotelephony is introduced in Europe on first-class passenger trains between Berlin and Hamburg (Informationszentrum Mobilfunk, 2012).
1940	The first radio transceiver, called Walkie Talkie (Motorola SCR-300), appears (H.S.Magnuski, 2005). Police departments and military are among the first customers.
1956	The world's first fully automated system for mobile telephony MTA is launched in Stockholm with eight subscribers (Billström, Cederquist, & Ewerbring, 2006). This marks the 0G (Generation Zero) milestone of cellular wireless standards with the first commercial subscriber networks being established.

Year	Event
1957	The first portable mobile phone, LK-1, is designed and patented by Soviet radio engineer Leonid Kupriyanovich. It is claimed that the first-ever mobile phone call was made by Mr. Kupriyanovich in October 1958, and not by Dr. Martin Cooper in 1973 (Izmerov, 2012).
1968	Filmmaker Stanley Kubrick showcases a flat-screen tablet device wirelessly playing a streaming video broadcast in the movie *2001: A Space Odyssey*, although no such devices or technology yet existed (imdb.com, 2012).
1969	George Sweigert of Euclid is granted US patent 3,449,750 for Duplex Radio Communication and Signalling Apparatus (wireless phone) (G.H.Sweigert, 1969).
1972	Amos Edward Joel, Jr. from Bell Labs is granted US patent 3,663,762 for Mobile Communication System, allowing uninterrupted continuous mobile communication when passing from one transmitter coverage area to another (Amos Edward Joel, 1972).
1973	Dr. Martin Cooper, a Motorola researcher and executive, is said to make the first mobile phone call on April 3, 1973 on a prototype model to Dr. Joel S. Engel of Bell Labs (Marples, 2008).
1974	Motorola launches the world's first pager, branded Pageboy. It has no display and cannot store messages. However, it is portable and notifies the wearer that a message has been sent (Bellis, 2012).
1978	The Bahrain Telephone Company begins operating the first commercial cellular telephone system. Cable and Wireless deploys the two-cell network based on Matsushita (Panasonic) equipment to serve 250 subscribers (Farley, 2005).
	This marks the 1G (First Generation) cellular wireless standards, where the analogue signal is transmitted wirelessly.
1982	Pencept Inc. of Waltham, Massachusetts launches Penpad 200, world's first tablet PC with handwriting recognition instead of a keyboard and mouse (The Week, 2010).
1983	Verne MacDonald (from Bell Labs) is granted US patent 4,399,555 for Cellular High Capacity Mobile Radiotelephone System (MacDonald, 1983).
1986	Number of mobile subscribers in the world surpasses one million (NationMaster.com, 2012).
1991	The first GSM network Radiolinja launches in Finland (On Elisa, 2004).
	Psion introduces the EPOC OS ("Electronic Piece Of Cheese," according to the legend), which later becomes Symbian OS (metalgrass.com, 2004).
	This marks the 2G (Second Generation) cellular wireless standards, where the analogue signal transmission is replaced with digital technology.
1992	Neil Papworth, a Vodafone engineer, sends the first SMS transmission with text "MERRY CHRISTMAS" to colleague Richard Jarvis on December 3, 1992 (a little bit too early) (Snowden, 2006).
1993	On August 2, 1993, at the Macworld Boston tradeshow Apple makes its first attempt to

Year	Event
	enter the market of tablets with the Newton device (Hormby, 2006).
1999	NTT DoCoMo in Japan launches full-fledged internet service on cell phones (NTT DoCoMo, 1999). Research in Motion (RIM) launches BlackBerry Enterprise Server (BlackBerry Corporation, 2006).
2000	Research in Motion introduces the RIM 957 Wireless Handheld and announces a development environment for Java (BlackBerry Corporation, 2006).
2001	Japan's NTT DoCoMo launches world's first commercial 3G network branded FOMA (NTT DoCoMo, 2001). This year marks the beginning of 3G (Third Generation) cellular wireless standards, optimized for wideband coding technology and allowing for increased data transmission rates for such data services as email and multimedia.
2002	Number of mobile subscribers in the world exceeds one billion (NationMaster.com, 2012).
2007	Apple releases iPhone on June 29, 2007. The release of the new phone coincides with the launch of the new operating system, iOS (Cohen, 2007).
2008	Google releases the first version of the Android operating system on September 23, 2008 (Dolcourt, 2011).
2009	The first publicly available LTE (Long Term Evolution) service is launched in Stockholm by Ericsson, Nokia Siemens Networks and in Oslo by Huaway on December 14, 2009 (Telia Sonera, 2009). This marks the beginning of 4G (Fourth Generation) mobile device standards, designed to provide comprehensive and secure IP-based mobile broadband solutions to any mobile device.
2010	Apple releases iPad tablet on April 30, 2010 (Keizer, 2010).
2011	Sixty-seven million tablets are shipped worldwide in 2011, more than tripling the 18.8 million number of 2010 (MarketWatch, 2012). Android Market (10 billion) (Chu, 2011) and Apple App Store (15 billion) (Pope, 2011) combined serve over 25 billion application downloads.

3.1.3 Industry Value Chain

The industry value chain consists of two main segments, product manufacturing and distribution. The product manufacturing stage starts with a product management function researching the target markets and subsequent formulation of requirements for a new product or a specific new feature of an existing product. Once such requirements are devised, the second

component of product manufacturing, product development, is called into action. The product development phase can be broken into three distinct components, the creation of technical specifications, the actual coding process and quality assurance. The market requirements identified by product management are broken down into individual architectural elements and translated into specific technological workflows and mechanisms at the stage of functional technical specifications. A detailed technical specification results in an identification of the necessary resources and estimated timelines to deliver on the original market requirements. At this stage the actual coding starts, followed by a thorough check against the original technical specifications and market requirements during the quality assurance phase. The quality assurance stage concludes the product manufacturing segment of the value chain; at this stage the product is ready to be consumed by target customers, entering the distribution segment.

The software industry has matured over the years and established numerous distribution channels. A hybrid model is often used, employing multiple channels at the same time, most often a combination of direct and other channel sales vehicles, such as Large Account Resellers (LARs), distributors or Value Added Resellers (VARs). In addition to direct and channel-based distribution vehicles, some software manufacturers establish non-branded channel offerings by making the core product functionality available as a part of an integrated solution through Software Development Kits (SDK) or Application Program Interfaces (API).

Figure 5 below represents the value chain of a MDM software offering:
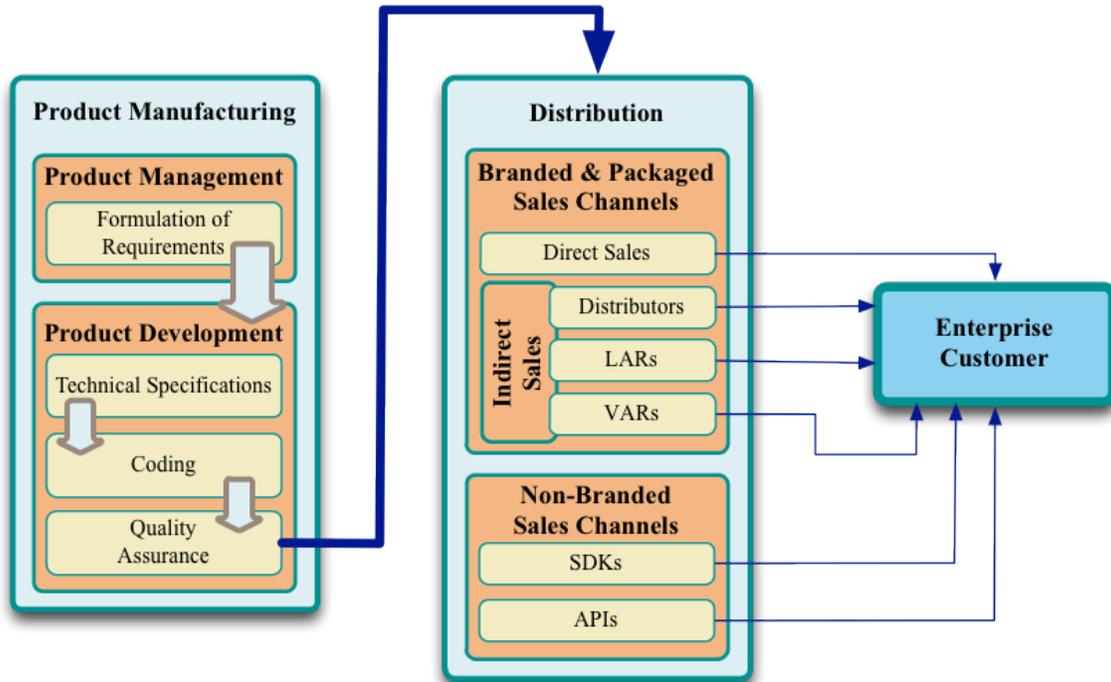
Figure 5 - MDM software value chain.

3.2   Competitors

The industry is in a state of flux at the moment with no clear single monopolistic leader or cohort of established oligopolistic industry participants offering cross-platform enterprise MDM capabilities. Although Research in Motion enjoys a leading position in managing BlackBerry devices, its inability to support any other operating system results in its continually declining popularity. With the influx of company- and employee-owned devices in an enterprise, many providers in adjacent functional areas are facing pressure from their customer base to address the growing need for mobile device management within the scope of products and services they already make available to their customer base.

There are numerous players within the industry value chain, and the pure-play MDM software solutions manufacturers are facing increasing pressure from a litany of recent industry entrants such as network security, network management, and computer systems management

solutions manufacturers that are now actively adopting various MDM capabilities within their customer offerings.

Traditionally larger enterprise computer systems management manufacturers, such as Microsoft with its product System Center Configuration Manager (SCCM), HP with OpenView, IBM with Tivoli, and Novell with ZenWorks, have addressed comprehensive computer configuration needs in an enterprise. Network security vendors such as Juniper Networks and network management providers such as Cisco have also significantly contributed to providing enterprise customers with tools to manage large numbers of computers, and are now actively pursuing the mobile device management space in order to allow their existing customers to manage their mobile devices alongside regular computers through the same set of tools.

Infrastructure providers such as Accenture are interested in adding enterprise MDM to their portfolio as well, because the mobile devices are now deeply embedded within the operational fabric of an information technology infrastructure and are often perceived by infrastructure consumers as an integral part of an offering.

Hardware manufacturers such as Apple are engaged in mobile device management to provide customers with the ability to control company-liable and employee-owned devices to effectively standardize a company's mobile fleet on one hardware vendor, for consistent user experience and streamlined functional capabilities.

Telecommunications companies own mobile service and broadband access in a relationship with a customer, and provide MDM capabilities as a value-add within a mobile communications service agreement.

Mobile application developers create packaged software products that run on mobile devices, but such products require access to application storefronts such as Google Play, Apple's

AppStore, or Partnerpedia's custom application stores, in order to make program content available to the end users, if such content cannot be downloaded onto a mobile device directly.

Figure 6 illustrates the landscape of MDM industry players.
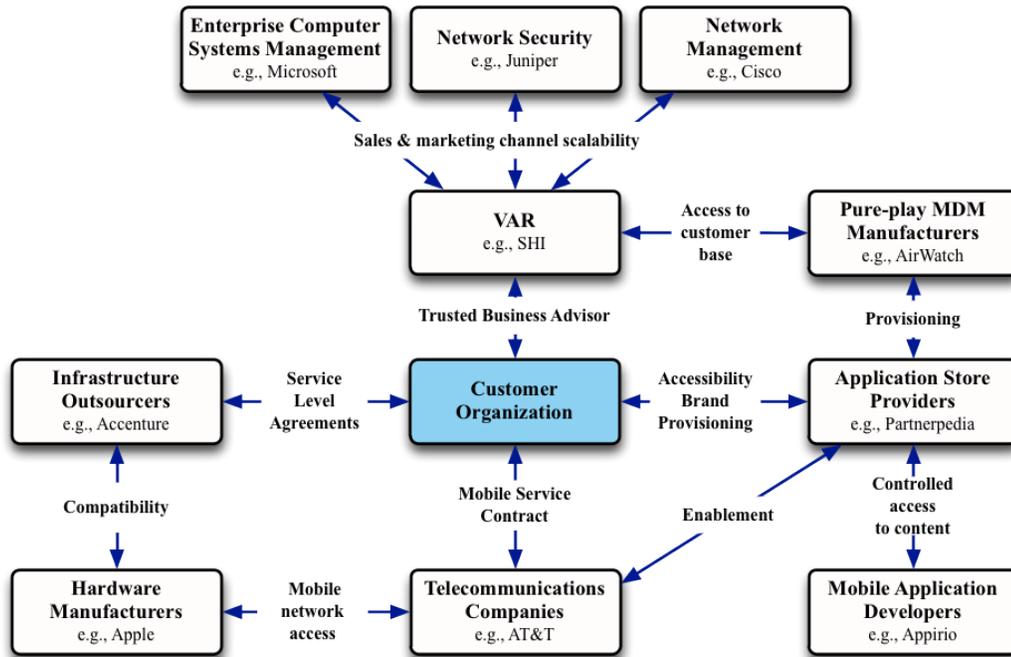
Figure 6 - Key enterprise MDM industry players.

The dynamic nature of the MDM industry is reflected in high levels of partnership and M&A activity. Large computer systems management vendors continue to acquire MDM providers to expand their customer offerings, such as Symantec with the acquisitions of Altiris and Odyssey Software, and Google with the acquisition of Motorola Mobility. On the other hand, Nokia, after having invested significantly in the space by acquiring Intellisync in 2007 and Symbian in 2008, has since switched exclusively to the Microsoft Windows Phone platform, effectively exiting the MDM market.

In addition to the larger computer systems management vendors, new industry players from such nascent fields as telecommunications expense management, mobile security and communications convergence are exhibiting signs of M&A activity within the MDM field,

making such pure-play MDM vendors as The Institution, AirWatch and BoxTone potential candidates for acquisition.

Table 4 reflects some of the recent M&A activity in the MDM space.

Table 4 - Recent MDM-Related M&A Activity.

Date	Acquirer	Target	Value
April 2007	Symantec	Altiris	$830M
June 2008	Nokia	Symbian	€264M
January 2009	Tangoe	InterNoded	N/A
December 2009	Absolute Software	LANRev GmbH	$14.6M
January 2010	Good Technology	CloudSync	N/A
May 2010	SAP	Sybase	$5.8B
May 2010	McAfee	Trust Digital	N/A
October 2011	Zenprise	Sparus Software	N/A
February 2011	Fixmo	Conceivium	N/A
May 2011	RIM	Ubitexx	N/A
August 2011	Google Inc.	Motorola Mobility	$12.5B
October 2011	Numara Software	Fromdistance	N/A
November 2011	Wyse Technology	Trellia Networks	N/A
December 2011	Tangoe	ProfitLine	$23.5M
March 2012	Symantec	Odyssey Software	N/A

The project evaluates 26 different competitors in the enterprise MDM space. The competition can be divided into two main categories, pure-play mobile device management solutions providers and companies that have enterprise MDM capabilities as an element of a comprehensive product portfolio offering. Table 22 in Appendix A summarizes organizational details of the companies mentioned below.

3.2.1   Pure-play enterprise MDM providers

All of the fifteen reviewed pure-play MDM providers are privately held. Good Technology is the largest pure-play MDM solutions manufacturer, followed by AirWatch, FiberLink, and MobileIron. Two of the reviewed pure-play MDM providers were acquired by companies that have MDM as a complementary functionality within their product portfolio

(Odyssey Software by Symantec and Ubitexx by Research in Motion). Here are the highlights of individual pure-play MDM vendors.

3.2.1.1 AirWatch

AirWatch was founded in 2003 and operates out of Atlanta, Georgia. Rooted in wireless network management services and ruggedized mobile devices, AirWatch provides comprehensive mobile device management capabilities across all major platforms: Android, iOS, BlackBerry, Symbian, Windows Mobile and Windows Phone.

In addition to a strong management console that features advanced dashboards and detailed reporting capabilities, AirWatch offers extensive policy management for various e-mail environments, such as any Post Office Protocol (POP), Internet Message Access Protocol (IMAP) or Simple Mail Transfer Protocol (SMTP) mail servers, as well as Lotus Domino, Novell GroupWise and Gmail.

AirWatch employs approximately 250 people and has an international presence in the EMEA and New Zealand / Australia region, but it still relies on North America for most of its revenues.

3.2.1.2 BoxTone

Originally founded as Panacya in 1999, BoxTone refocused its corporate strategy on the mobile software industry in 2005. Operating out of its Columbia, Maryland office, BoxTone has a well-established customer base of BlackBerry device management. In addition to BlackBerry support, BoxTone also supports Android and Apple iOS platforms. It also integrates with leading system management platforms, such as SCCM and Active Directory from Microsoft, OpenView form HP and IBM's Tivoli.

BoxTone's technology relies on server-based architecture and does not require on-device agents. It manages devices, applications and mobile services remotely via a set of native APIs.

Employing approximately 90 people. BoxTone goes to market primarily in North America with a hybrid model of direct sales force, Value Added Resellers (VAR) and Managed Service Providers (MSP).

3.2.1.3   Capricode

Founded in 2002, privately-held Capricode employs about 20 people and is headquartered in Oulu, Finland. Capricode brings its mobile device management solution to market through two sales offices located in Helsinki, Finland and London, UK.

Capricode's SyncShield Advanced Mobile Device Management solution supports iOS, Android, Windows Mobile and Symbian OS. It can be deployed on-premises, used as a hosted solution from service providers, or as a Software as a Service (SaaS) offering. No support for BlackBerry devices is available.

3.2.1.4   Excitor

Founded in 2001, Excitor A/S operates out of its Copenhagen, Denmark offices with just over 50 employees. The company's MDM solution DME Mobile Device Manager emerged from Excitor's mobile e-mail solution offering.

Although most of Excitor's installed base resides in the Nordic countries, the company has recently added locations in Surrey, UK, New York, USA and Makati City in the Philippines.

3.2.1.5   FancyFon Software

Founded in 2006, FancyFon is based in Cork, Ireland and focuses exclusively on multiplatform mobile device management. FancyFon Mobility Center has a comprehensive feature set and is available as an on-premises or a hosted solution, offering support for iOS, Android, BlackBerry, Windows Mobile and Windows Phone 7.

3.2.1.6   Fiberlink Communications

Founded in 1991, Fiberlink is among the oldest players in the MDM industry. The company emerged with its MDM product MaaS360 from offering a connection agent to provide Internet access for traveling users globally.

Fiberlink has established offices in the USA (Blue Bell, Pennsylvania), Germany (Munich), UK (London) and India (Bangalore), employing over 200 people. MaaS360 supports Android, BlackBerry, iOS, Symbian OS, Windows Mobile and Windows Phone 7 platforms.

3.2.1.7   Fixmo

Based in Toronto, Canada, Fixmo was founded in 2004 and now employs just over 50 people in its Toronto and Sterling, Virginia offices.

In February 2011 Fixmo announced the acquisition of a smaller pure-play MDM vendor Conceivium, which specialized in a value-added management of BlackBerry, iOS and Android - based devices. This acquisition will enable Fixmo to augment its end-node management capabilities to include a solid MDM offering through Conceivium's MobileMonitor technology.

3.2.1.8   Good Technology

Founded in 1999 to provide synchronization of enterprise email and business information on mobile devices, Good Technology was acquired by Motorola in 2008, just to be taken private again by the mobile email management company Visto in 2009. Good Technology is headquartered in Sunnyvale, California and employs over 700 people. Good Technology enjoys a strong global presence. In addition to its New Jersey, Washington, New York, California and Texas offices in the US, Good has offices in Australia, Italy, China, Korea, Spain, France, the UK and Germany.

Good Technology is focusing its MDM offering on security and has had significant

success with financial services, government and healthcare markets, notwithstanding the fact that

it lacks BlackBerry support.

3.2.1.9   IBELEM

IBELEM is a subsidiary of ITS Group, a publicly held French IT consulting services

company. Founded in 2001 and based in Nanterre, France, IBELEM was acquired by ITS Group

in 2004. The company has just over 20 employees and two main revenue drivers: manufacturing

of MDM software and consulting services to integrate the company's and third-party mobile

solutions, such as BlackBerry Enterprise Server or VPN.

IBELEM's sales and marketing efforts are focused in France. The company's

international footprint is very limited.

3.2.1.10   MobileIron

MobileIron is a relatively new entrant among the pure-play MDM vendors. The company

was founded in 2007 and is based in Mountain View, California. MobileIron is backed by several

reputable VC firms including Sequoia Capital and NVP. With over $20M invested and over 200

employees, MobileIron features a comprehensive product offering for mobile device and

application management. Although no SDK is available, the company's careers page at the time

of writing lists an opening for an SDK technical writer, which may be indicative of an SDK being

worked on.

3.2.1.11   Odyssey Software

Odyssey Software was founded in 1996 and operates from its West Henrietta, New York

office with 39 employees. In addition to its flagship product Athena MDM, Odyssey has

dedicated offerings for the Microsoft System Center Configuration Manager and BlackBerry Enterprise Server.

Besides branded MDM solutions, Odyssey Software has a partner program for independent software vendors to bring MDM capabilities to their customer base through the integration of Odyssey's technology into their respective existing management solutions. For example, Lumension Security, a computer systems management software vendor, utilizes Odyssey's technology to bring to market its MDM offering, Lumension Endpoint Management and Security Suite (Mukhar, 2012).

While this project was being prepared, Symantec acquired Odyssey Software on March 2, 2012 for an undisclosed amount.

3.2.1.12 SOTI

With approximately 100 employees, SOTI operates out of its offices in Mississauga, Ontario, Canada. Its flagship MDM software product MobiControl has gained popularity in several vertical markets, deploying ruggedized mobile devices, at an expense of awareness in the generic smartphone market. An SDK offering is offered for iOS-based devices. The range of functionality available across different mobile platforms varies significantly. The company claims more than 80,000 customers in over 150 countries, and 400 support and implementation partners.

3.2.1.13 The Institution

The Institution is a pure-play MDM software platform manufacturer based in Stockholm, Sweden. Since its inception in 2006 the company has seen steady growth, primarily through channel partner-driven sales in large accounts. Its MDM product Revival can be delivered on-premises, hosted or as a SaaS solution, but lacks BlackBerry support. The privately held company has a limited installed base, which is heavily concentrated in the Nordic region.

3.2.1.14 Ubitexx (RIM)

Founded as a consulting company in 2002 in Munich, Germany, Ubitexx helped its clients organize traveling sales and mobile workforces. In 2005 Ubitexx started development of its dedicated MDM offering ubi-Suite, which by 2008 became company's flagship product. A privately held company with VC backing, Ubitexx has a limited installed base, which is concentrated in German-speaking European regions. Its sales and marketing efforts outside Germany and Austria were weak before the company was acquired by Research in Motion (BlackBerry) in May 2011 at undisclosed terms.

The expectation is that the acquisition of Ubitexx will allow Research in Motion to expand the capabilities of the BlackBerry Enterprise Server to offer similar comprehensive MDM functionality for iOS, Android and Windows based devices.

3.2.1.15 Zenprise

Founded in 2003 and headquartered in Fremont, California, Zenprise is a relatively small company with just over 100 employees focused exclusively on MDM. Although Zenprise has limited staff, the company has offices in France, the UK, Germany and the Netherlands in addition to the US. The company's MDM offering, Zenprise Mobile Manager, has a comprehensive feature set for managing both corporate and personal devices. Web content and URL filtering on mobile devices differentiate Zenprise Mobile Manager from its competitors.

3.2.2 Conglomerate solution providers with an MDM offering

In addition to the 15 pure-play MDM solution providers, the project reviews 11 vendors that have an established enterprise MDM offering within their product portfolio conglomerate. A brief overview of these solution providers follows.

3.2.2.1 Absolute Software

Absolute Software was founded by its present chairman and CEO John Livingston in 1993 with a stated mission to manage, secure and recover mobile devices regardless of their location. Having primarily concentrated on recovery and data wipe on notebook computers though embedding Absolute's flagship recovery software Computrace in a computer's BIOS, Absolute Software has advanced its product offering onto mobile devices through a computer system management framework LANRev, which it acquired in December 2009. At the time of acquisition, LANRev did not have MDM capabilities.

With more than 300 employees and offices in Vancouver, Canada, Austin, Texas and London, UK, Absolute Software is actively developing its MDM offering through the Absolute Manage platform, based on the underlying LANRev technology.

3.2.2.2 Apple

It would be a mistake to omit the actual mobile device operating system manufacturers from the list of competing MDM vendors. Apple had not provided any means of enterprise-level MDM until the release of Mac OS X Lion Server in July 2011.

The MDM capabilities provided by the Mac OS X Lion Server are delivered through its Profile Manager, which uses directory services and the Apple Push Notification service to administer configuration profiles to Mac OS X and iOS devices. No third-party devices or application management are supported, and available functionality and integration options are very limited.

3.2.2.3 Google

Google has been offering limited MDM capabilities to its enterprise customers through its Google Apps platform since October 2010, when it first introduced new mobile device-oriented

policies to its Apps administrators. Only Android 2.2 and higher devices qualified and the number of features was very limited.

In November 2011 Google expanded the MDM offering to include iOS and Windows based devices. Google Apps administrators can now determine which mobile devices are syncing information with Google Apps, and, if required, revoke access to individual devices, define password requirements, roaming sync preferences, and view analytics information, such as how much data devices are moving.

Marketed as a complimentary MDM offering for paying Google Apps subscribers, the functionality provided is very limited and unavailable as a standalone offering.

3.2.2.4   McAfee

Founded in 1989 by John McAfee, McAfee quickly became a significant player in the computer security software industry, offering a comprehensive suite of anti-virus, encryption and endpoint management capabilities.

McAfee entered the MDM industry through the acquisition of pure-play MDM vendor Trust Digital in May 2010. The McAfee Enterprise Mobility Management suite offers comprehensive MDM functionality and integrates with the company's ePolicy security suite.

Intel Corporation acquired McAfee in August 2010 for $7.68B.

3.2.2.5   Microsoft

Microsoft offers a number of mobile operating systems, such as Windows CE, Windows Mobile, Windows Phone and Windows 8. Microsoft provides a number of fragmented tools that allow some basic MDM functionality for enterprise-level device life cycle management.

The System Center Mobile Device Manager enables some basic configuration options for customers using Group Policies within an Active Directory environment.

ActiveSync integrates with Microsoft Exchange for improved email, calendaring and task delivery on mobile devices.

The Microsoft System Center Configuration Manager provides limited management functionality to Microsoft OS-based devices, and functionality varies significantly based on the OS and the version of SCCM. No third-party operating systems are supported. The new SCCM version 12, which is expected to be released sometime at the end of 2012, claims support for Android, iOS and BlackBerry in addition to Windows-based mobile devices.

3.2.2.6 Numara Software (BMC Software)

Founded in 1991 as Blue Ocean Software, Numara Software quickly grew due to its popular helpdesk tool Track-It!, leading to an acquisition by Intuit in September 2002.

In 2005 the company was taken private again by a private equity firm and renamed Numara Software. In January 2012 Numara became a public company once again through an acquisition by BMC Software.

Numara specializes in integrated IT service and asset management software platforms and augmented its MDM offering through an acquisition of a pure-play MDM vendor from Estonia, Fromdistance, in October 2011.

Fromdistance was founded in 2004 in Tallinn, Estonia to provide software solutions to manage mobile devices and applications. Fromdistance MDM supports BlackBerry OS, Symbian, Apple iOS, Android and Windows Mobile platforms.

3.2.2.7 Research in Motion

Research in Motion has experienced a series of infrastructure outages and product delays in the last two years, reducing its capitalization by over 80%, and bringing its market share down, resulting in accelerated rates of iOS and Android based devices entering the enterprise market.

The company's BlackBerry Enterprise Server still remains a golden standard of mobile device management for BlackBerry devices with close to 600 configurable policies.

Although very feature-rich and mature, BES only supports BlackBerry OS-based devices. Support for its new PlayBook tablet is very limited. No support for any third-party mobile OS is provided. BES is a great choice for a homogeneous BlackBerry-based environment, but fails in a real-life fragmented device enterprise landscape, where support for multiple devices is now required.

3.2.2.8   Smith Micro Software

Founded in 1982, Smith Micro Software is a publicly held company with 550 employees operating out of its headquarters in Aliso Viejo, California and offices in California, Pennsylvania, British Columbia, the UK, Serbia, China and Australia. The company provides many leading wireless communication operators with device connectivity solutions. In addition to a strong consumer offering, Smith Micro produces mobile device management solutions for corporate customers. Besides mobile device-oriented products, Smith Micro manufactures a cohort of consumer software products for computer diagnosis, data compression and fax transmission.

Smith Micro has established a commercial partnership with HTC and supplies its MDM client for HTC Android-based handsets shipping to North American and Asian markets.

3.2.2.9   Sybase (SAP)

Sybase, now an SAP company, is based in Dublin, California. Founded in 1984 to create a client-server relational database, Sybase counts among the longest-established MDM platforms, with its roots reaching back to PCs and mobile terminals in the late 1980s. Its MDM offering Afaria was originally created for laptop computers in 1997 and later released in 2000 as the first

nonindustrial MDM software platform. Today it constitutes the most mature platform among MDM vendors for managed software distribution.

3.2.2.10 Symantec

Symantec is a prominent global security player, with strong positions in desktop and laptop anti-virus, encryption and comprehensive endpoint management. Symantec has added MDM capabilities to its product portfolio through acquisition of Altiris in 2007 and Odyssey Software in 2012. Although Symantec has been offering MDM capabilities for years, and has accumulated many individual components to constitute a very strong MDM platform, its traditionally strong focus on security results in weaker delivery on integrated operational and device life cycle management requirements.

3.2.2.11 Tangoe

Founded as TelecomRFQ in 2000 to improve telecom-related expense management, the company changed its name to Tangoe in 2001. Based in Orange, Connecticut, Tangoe operates with over 800 employees out of its 10 offices in the US, and has offices in Canada, the UK, Netherlands and China.

Although its major revenue source remains telecom expense management, Tangoe sees increased adoption of its MDM platform, which it has integrated through the acquisition of InterNoded in 2009.

3.3 Functionality Summary

The respective enterprise MDM solutions from the above-mentioned industry players have been evaluated in terms of the following commonly offered functionalities. The customer base has matured along with the MDM manufacturers and has come to expect certain features in any solution that is being offered.

3.3.1 Operating System Support

The MDM functionality across multiple mobile operating systems varies significantly. While certain features might be available on one platform, the same features cannot be technically delivered on another due to architectural limitations imposed by the OS manufacturer. Development tools and device capabilities are also very different, presenting a challenge for MDM players to support multiple operating systems and deliver similar levels of functionality across multiple mobile platforms.

3.3.2 Real-time inventory

Real-time inventory includes current information about system configuration, installed applications, and security configuration that allow MDM solutions to identify any configuration compliance violations and perform required remediation.

3.3.3 Self-service portal

Self-service portals lower IT staff-to-device ratios and reduce operational costs as employees can review their mobile and expense policies, request software, and backup and restore their devices without involving IT personnel.

3.3.4 Over-the-air (OTA) configuration

The availability of OTA configuration allows IT administrators to manage devices regardless of their current location and dictate different security, application, and configuration policies for myriad user groups remotely.

3.3.5 Mobile application management

Mobile application management provides granular control over mobile application provisioning via three distinct avenues: remote software distribution and updates, application whitelisting and blacklisting, and app store restrictions.

3.3.6   Selective data wipe

A selective data wipe allows the complete erasure of organization-related data only from a mobile device, while leaving an individual's personal information intact. This functionality is often requested by organizations with active BYOD programs.

3.3.7   URL filtering

Due to liability and compliance issues, many organizations require an ability to filter which websites their mobile users can access when assigned a company-affiliated IP address or when identified as located on a company's premises via GPS coordinates.

3.3.8   API/SDK availability

Several pure-play MDM vendors have created software development kits (SDK) and collections of Application Program Interfaces (APIs) that represent additional revenue channels. A third-party company such as a computer systems management vendor can use such SDKs and APIs to integrate MDM functionality into their existing framework, effectively offering MDM capabilities without actually developing those.

Table 23 in Appendix B presents an overview of the above-described functionalities offered by the enterprise MDM players reviewed in Chapter 3.2.

3.4 Customers

3.4.1 Market Size and Growth Rate

The global MDM space is evolving very quickly and its market size estimates vary significantly from analyst to analyst. The leading industry analyst IDC estimates the MDM market at approximately $300M in 2011 and growing by a CAGR of 7.6%, expected to reach $383 by 2014 (IDC, 2010). Gartner estimates are significantly lower and assess the MDM market to be at the $150M mark, increasing at CAGR of 15% to 20% for the next three years (Redman, Girard, & Leif-Olof, 2011). This lower number, however, excludes security products, thus indicating the great role (50%) mobile security plays within the MDM functionality set.

The geographical distribution of the MDM market is relatively Americas-focused, with close to 70% of revenues attributed to this region by IDC. EMEA and APAC, although reporting a lower revenue share, are expected to grow at a higher CAGR of 8.7% (EMEA) and 9.2% (APAC) in the near future (IDC, 2010).

Following a slowdown in the MDM space in 2009, both 2010 and 2011 were marked by a significant increase in activity largely attributed to an exploding tablet market, increased acceptance of employee-liable devices (BYOD), a maturing Android platform and Research in Motion's inability to perform. The accelerating trend continues in 2012 and the industry shows no signs of slowing down.

3.4.2 Customer Segments

Financial services, government, healthcare, legal and professional services, education and retail emerged as the vertical markets most actively acquiring MDM technologies. Only the healthcare and education markets are expected to grow in the near future.

3.4.2.1 Financial Services

Financial services organizations ranging from top global banks to small credit unions are actively adopting MDM solutions. These organizations were among the first to adopt secure wireless email over 10 years ago to improve efficiency and decision-making speed. Present end-user demand and hardened security regulations require the financial sector to support new smartphone and tablet platforms and securely deliver mobile enterprise applications. Security is paramount in this sector and many organizations struggle with the task of providing a great customer experience without the compromising security required for regulatory compliance.

For most financial organizations, MDM starts with basic device management functionalities such as lock, wipe, enforce password use, and encryption, but then quickly escalates to certificates, user access control and separation of personal and professional data.

The financial services industry comprises three primary sectors: banking, securities and commodities, and insurance. This industry has been experiencing a period of decline since the 2008 global economic downturn and is unlikely to grow significantly within the next two to three years.

3.4.2.2 Government

Government workers, just like those in the commercial sector, were previously almost exclusively BlackBerry users, and are actively adopting BYOD on iOS and Android platforms without coordination with or permission from IT. Employees desire a greater choice in mobile devices and applications to remain productive and efficient in light of shrinking budgets and increased responsibilities. Agencies, however, are faced with regulatory compliance acts such as HIPAA (Health Insurance Portability Act and Accountability Act in the US), PIPEDA (Personal Information Protection and Electronic Documents Act in Canada) or FISPA (Federal Information Security Management Act in the US).

With modern MDM solutions, government IT departments can leverage the new generation of smartphones and tablets to improve communication, collaboration and productivity among agency staff, between different agencies and with corresponding constituents. Mobile security, compliance and data loss prevention are the main points of interest in MDM for the government sector.

Similarly to the financial services industry, the government sector is unlikely to grow in the near future due to a prolonged recovery from the 2008 economic downturn.

3.4.2.3   Healthcare

Healthcare providers are also embracing mobility at a very rapid rate and transforming their business. Mobile devices enhance patient care and improve operational efficiency but must ensure adherence to government's stringent regulatory standards. There is a new generation of physicians emerging that actively embraces mobile technology in its day-to-day operations. Such practitioners use their mobile devices in clinical settings to access decision tools, learn about new treatments, look up reference material, and handle patient information. Access to Electronic Medical Records (EMR) tops doctors' key requirements in their use of mobile technology. Real-time data security and data loss prevention are key concerns for the healthcare sector in light of such regulations as HIPAA (in the US), PIPEDA (in Canada) or DPA (Data Protection Act in the UK).

The healthcare industry, unlike financial services or the government sector, is expected to grow in the near future. The aging baby boomer generation and longer life expectancy create more demand for healthcare services. According to the US Bureau of Labor Statistics, of the 22 major occupational groups, employment in healthcare support occupations is expected to grow most rapidly at 34.5%, followed by personal care and services occupations at 26.8%, and

healthcare practitioners and technical occupations at 25.9% (US Bureau of Labor Statistics, 2012).

3.4.2.4 Legal and Professional Services

For any professional services consultant, such as attorneys or legal professionals, maximizing billable time is of utmost importance. MDM allows such professional services firms to maximize the productivity of their staff, increase customer satisfaction and exercise greater control over business process costs. However, making the most efficient use of their knowledge workers requires a reliable mobility solution that provides access to critical resources and information for company staff as they need it in real time, regardless of location. Mobile devices enable such professionals to collaborate with partners, access research data, and connect to company resources and proprietary information easily and securely from a client's location while in transit, or any time they are away from their desks. MDM solutions enable professional knowledge workers to stay connected and informed to better serve clients, be more productive, and generate more revenue. Mobile devices shorten the internal approval cycles by enabling out-of-office consultants to access, review, file, edit and exchange information from their mobile devices. Maximizing staff productivity and securing access to case and other professional project information are among the top priorities for professional services organizations when utilizing mobile technologies.

Comparable to financial services and government, legal and professional services are unlikely to grow at a significant rate within the near future due to the slow rate of recovery from the recent economic downturn. Although niche sectors as factoring and microfinance are on the rise, core revenue generators in the real estate sector are recovering very slowly.

3.4.2.5   Education

Educational institutions operate the largest computer networks in the world. The top three school districts in the US, in New York City, Los Angeles and Chicago, manage networks with over 100,000 computers each. No other computing environment experiences such a high degree of annual user churn, where every year a great number of newly enrolled users need to be provisioned while an equally large number need to be retired after graduation. The growth of smartphone and tablet use among educators and students is growing at an unprecedented rate.

Where mobile devices were previously considered distractions and had been banned from the premises, they have now become enablement agents for better education, delivering curriculum in real time regardless of location or time of day. Syllabus applications, class-level collaboration, course requirements, and group and individual assignments are easily and securely shared across heterogeneous device base. Compliance with acceptable use policies and ease of use are among the top requirements within the education sector when it comes to use of mobile technology. Modern MDM solutions enable easy initial provisioning of devices and ensure that defined policies are enforced on both school-owned and student-liable devices.

Education is another industry that is expected to grow at a healthy rate in the near future, as greater numbers of children and adults enrolling in all types of schools will generate employment growth in this industry. A large number of retirements will create additional job openings in educational services. Enrollments are expected to grow at a faster rate in postsecondary institutions as more high school graduates attend college and more working adults return to school to enhance or update their skills, especially during recession periods (Bureau of Labor Statistics, 2009).

3.4.2.6 Retail

Organizations in the retail sector rely on real-time access to inventory and product information for efficient operations and competitive advantage. An optimized supply chain can make or break a business in this low-margin and high-volume sector. MDM solutions in the retail sector are primarily popular among very large retailers, because before organizations can fully utilize mobile devices at every stage of their value chain, they must create an automated underlying technology infrastructure to ensure great levels of service while lowering support costs and minimizing risks to the organization from device loss or misappropriation. The core drivers for MDM adoption in the retail sector are the ability to optimize the supply chain on the fly regardless of location, and a detailed audit trail of mobile device and application activity.

The retail industry is still struggling because of the housing market crash, the financial meltdown, high gas prices, and high levels of unemployment. Retail is unlikely to experience a high growth rate in the near future, but the chances of success are greater for those individual industry players that use mobile technology to differentiate themselves from the competition, optimize their supply chain, and improve their cost structure. Both store and non-store retailing sectors will adopt new technologies to increase customer loyalty, optimize pricing, and provide consistent experience across all sales channels (Fanfan, 2011).

Table 5 summarizes key customer benefits, the importance of regulatory compliance, and near-term growth potential across identified target verticals.

Table 5 - Summary of MDM Benefits by Customer Segment.

Vertical	MDM Benefit	Importance of Regulatory Compliance	Growth Potential
Financial Services	Improve efficiency of decision making	High	No Growth
Government	Increase staff productivity	High	No Growth
Healthcare	Provide instant mobile access to decision tools and health records	High	Growth
Legal and	Increase staff productivity	Low	No Growth

Vertical	MDM Benefit	Importance of Regulatory Compliance	Growth Potential
Pro Services			
Education	Enhance learning effectiveness and teaching efficiency	High	Growth
Retail	Optimize supply chain	Low	No Growth

3.4.3   Opportunities and Threats

The MDM industry is full of opportunities. In addition to pure-play enterprise MDM solutions providers, a cohort of companies from a variety of industries has entered the MDM space to offer mobile device management capabilities to its customer base.

The opportunity tradeoff is represented by a significant risk of fragmented functionality that can be made available across devices running different operating systems. Providing inconsistent user experience across multiple platforms can negatively impact product and company reputation beyond its MDM offering.

Another important risk element is that of the six identified industries, only two have growth outlook, while the others are recovering and may be unlikely to commit budgets to an MDM offering.

3.5 Suppliers

The main input for the enterprise MDM solutions manufacturers is professional human capital, capable of innovation and creation of sophisticated software solutions to manage mobile devices. Globally, growing literacy levels and a positive outlook for the education industry's future contribute to a bright outlook for software companies to be able to recruit innovative and knowledgeable talent.

The mobile operating system manufacturers Microsoft, Google and Apple provide readily available and well-documented software development tools that no longer require deep technical expertise to create mobile products, further lowering the necessary skill requirements for mobile

software development, and therefore increasing the pool of potentially qualified software development talent.

3.6 Five Forces Analysis

3.6.1   Rivalry - High

The degree of rivalry in the enterprise MDM software industry is high due to a low degree of differentiation. The same feature set is universally offered across many solution providers and is largely limited by what information the mobile OS manufacturers make available for external APIs. Individual industry players often compete on price and try to differentiate themselves through focus on specific vertical solutions such as MDM for financial services or healthcare industries, or geographical outreach such as concentration on the US or Nordic market.

First-to-market advantage has limited benefits with high degrees of rivalry as longest-established players fail to acquire a dominant position, and those who have lose it quickly under the pressure from new pure-play MDM vendors or adjacent industry players extending their offerings into the MDM space.

The degree of rivalry will continue to be high because more vendors will enter this technology space that is ripe with M&A opportunities; barriers to entry are low and the potential differentiation opportunities are limited. In the long term (five to ten years), however, it is likely that the enterprise MDM market will roll up into the general computer life cycle management industry, which is dominated by a few large players that will have acquired all innovative pure-play MDM players by then. That will cause the remaining players to fade away due to their inability to draw sustainable rents under aggressive price competition with weak cost structures and lack of economies of scale and scope. This colossal change will take place slowly, gradually changing the nature of rivalry in the industry to provide more differentiation opportunities, thus lowering the degree of rivalry to moderate in the long term.

3.6.2   Threat of Entry - Moderate

Entry barriers to the enterprise MDM software industry are relatively low, because no significant capital expenditures are required to start developing the necessary software components. Mobile operating system vendors Google, Apple and Microsoft make their detailed technical documentation readily available to interested software manufacturers and can support their software development efforts with dedicated resources and expert advice.

The level of technical expertise required for mobile software development is also relatively low. A high school level education is often sufficient to start creating sophisticated mobile software applications. Professional mobile development tools are affordable, readily available and well documented. The software can be tested in a virtual environment, or on actual hardware that can be accessed at a low price through mobile equipment testing facilities such as WaveFront (http://www.wavefrontac.com/), offering hundreds of different mobile devices for timed software testing without the need to acquire such devices permanently.

These low barriers to entry would have made the threat of new entrants high for incumbent industry players if not for industry alliances and a different development environment used for the creation of mobile applications.

In order to be able to offer cross-platform enterprise MDM solutions, an industry entrant needs to pass through several steps in establishing technology alliances with key mobile OS manufacturers. This process takes time and resources to navigate the hairball of regulations and procedures in order to satisfy the partnership requirements.

Mobile applications require a different set of development tools. User experience on mobile devices is also very different from that on a desktop or a laptop computer, which have far greater screen real estate. New development tools and programming languages and interfaces present adoption challenges even for a company already involved in computer software

development, because new tools need to be acquired and integrated, new programming languages need to be learned, or talent already proficient in said tools and languages needs to be acquired.

Both technology alliances and the change in development tools and environments increase the barriers to enter the enterprise MDM software industry, thus lowering the threat of new entrants. This offsets the positive effect of low capital and minimal technical knowledge requirements, allowing us to categorize the threat of new entrants as moderate.

The MDM industry is maturing and the high degree of M&A activity is indicative of a gradual increase in industry concentration. It is very likely that new pure-play enterprise MDM startups will continue to emerge, with the ultimate exit strategy of being acquired by one of the larger systems management vendors. Such new startups will, most likely, try to differentiate themselves through filling a void in a vertical offering of a large systems management vendor like Microsoft, IBM or Symantec, triggering an eventual acquisition by such vendors in order to fill that void with developed and proven technology.

The balance between the capital and knowledge requirements on the one side, and alliances and development environments on the other side, dictates the degree of threat of new entrants. Any change in this balance will affect how players enter and exit this industry. The capital and knowledge requirements are unlikely to change in the future, but both the alliance requirement and procedures and development environments are likely to evolve. Simplification of the relationship framework with mobile operating system vendors will increase the threat of new entrants. Mobile devices are becoming more and more powerful, often superseding existing desktop computers in processing power, causing the line between mobile and desktop operating systems to blur. It is entirely possible that in the future both mobile devices and regular computers will run the same underlying operating system, converging the development tools and environments in the long run, further lowering the barriers to entry and escalating the threat of

new entrants. This is why it is entirely possible that the threat of new entrants for the enterprise MDM software industry in the long run will escalate from moderate to high.

3.6.3   Substitutes - Low

There are not too many ways to substitute the value proposition that enterprise MDM solutions provide. The most common alternative to a commercial MDM solution is allowing individual device users to administer those devices themselves, which leads to great security risks and lower employee productivity.

Another potential substitute is an open source MDM solution such as Funambol (www.funambol.com), but such open source solutions lack features that customers take for granted, are not scalable in an enterprise environment, lack support and are complex to implement and maintain.

The low degree of substitution in the enterprise MDM industry may shift towards moderate if consumer-oriented mobile application developers such as DataViz with its Documents to Go (www.dataviz.com) offering start offering comprehensive multiple device management capabilities within their applications. In this scenario, such application providers as Evernote (www.evernote.com) will enable group account administrators to manage additional device parameters, extending the core product value proposition just enough for an enterprise customer to use this tool to manage her mobile cross-platform devices already equipped with value-generating client applications.

3.6.3.1   Buyer Power - High

The nature of enterprise MDM solutions customers is such that the need for a dedicated MDM solution arises when there are many devices that need to be managed. The large number of devices translates into a large order size, increasing the customers' buyer power and ability to

capitalize on the high degree of rivalry in the industry among numerous and poorly differentiated players competing on price.

Future industry consolidation will lead to an oligopolistic industry makeup with a few large systems management suite vendors, which will allow such vendors to increase their differentiation, develop distinct core competencies and avoid competing on price exclusively, thus decreasing the buyer power of individual MDM customers.

3.6.4   Supplier Power - Low

The main supplier for the enterprise MDM solution manufacturers is their knowledge workers, who exchange their skill and time in development of MDM functionality for compensation.

The industry of off- and onshore programming has matured significantly. Companies can now easily outsource or acquire necessary talent for coding MDM components. The readily and publicly available technical documentation, training and development tools make the mobile development skills easy to acquire, thus significantly lowering the supplier power.

The future convergence of mobile and regular computer operating systems will eventually lead to the programming environments merging as well, resulting in mobile application developers using the same set of fused tools as regular computer software programmers. Merged technologies will reduce the existing differentiation mobile developers and regular software programmers maintain, making the skills interchangeable and thus further lowering the supplier power.

3.6.5   Summary of Observations

The present moment in the history of enterprise MDM is very interesting, the industry is developing very actively, experiencing a lot of innovation and M&A activity. Here are some key observations:

- The enterprise MDM market in its present form is a temporary phenomenon. It presents a great opportunity for computer systems management software manufacturers to extend their product portfolio.

- As development tools and environments mature, mobile and regular computer software development tools will converge, accelerating the threat of new entrants and lowering supplier power.

- Existing mobile application providers like Evernote are likely to extend management capabilities, making their product attractive enough for end users to use such tools to manage their enterprise mobile devices.

- Based on present levels of M&A activity in the enterprise MDM space, where larger conglomerate solution providers acquire or partner with pure-play MDM vendors, it is likely that further industry concentration will result in an oligopolistic market makeup with a few large players able to differentiate their offerings and reduce buyer power.

Figure 7 below illustrates the assessment of the Five Forces at the present moment. The following Figure 8 depicts the same assessment in the future, where only supplier power remains low, rivalry and buyer power forces decline, and substitutes and threats of entry escalate.
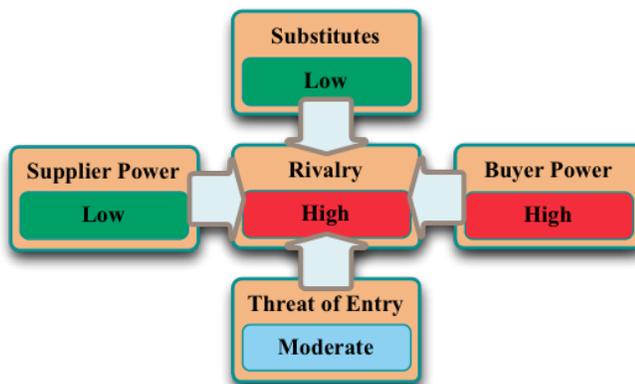
Figure 7 - Assessment of the Five Forces now.
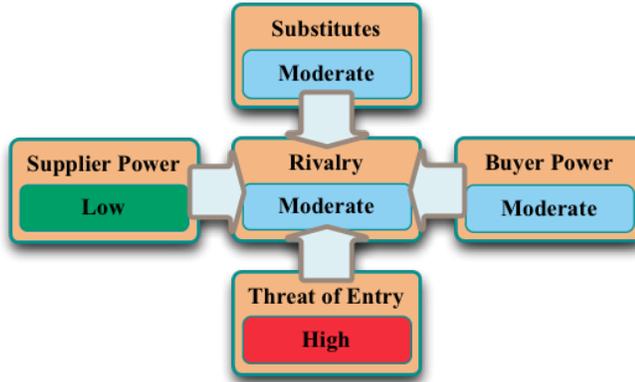
Figure 8 - Assessment of the Five Forces in the future.

3.7 Sources of Advantage

In this section I will identify several key success factors or attributes that industry players possess, which them advantages in the marketplace over other market participants. There are two major sources of such advantage: the cost structure on the one side, and specific traits that allow a company to deliver greater customer value compared to competitors on the other.

3.7.1 Cost Advantages

3.7.1.1 Economies of scope

Economies of scope represent the most important source of cost advantage among enterprise MDM software manufacturers. The existing infrastructure and processes for product manufacturing and distribution can be used to add an MDM offering without any extra investment, presenting systems management software manufacturers with a great cost advantage over organizations that yet have to establish such infrastructure and processes.

Computer systems management providers can tap into the existing product management, quality assurance and sales and marketing functional units to deliver MDM offerings to existing and new customers at a marginal increase in associated costs. The minimal increase can be

attributed to extra development resources that would need to be acquired to code the MDM product components.

Creation of a distribution network is a time-consuming and expensive undertaking. Companies with established distribution channels significantly benefit from such economies of scope, being able to sell the new MDM product through the existing and functioning network of sales channels, where pure-play MDM vendors often have to spend time and resources establishing such distribution channels.

Another benefit of economies of scope lies in systems management companies having an established physical backend product management infrastructure, such as network management protocols, management consoles, cloud storage farms and database clusters, where a new MDM offering can be added without any major system redesign, increase in operating costs, or acquisition of new skills and capabilities. Enterprise MDM solutions require such comprehensive and technically complex backend infrastructure in order to run; However, companies that are removed from computer systems management do not typically have such physical infrastructure established, lack capabilities and human capital to create and maintain it, and will face a significant investment to build up the required infrastructure for the enterprise MDM offering.

3.7.1.2   Economies of learning

Economies of learning represent the second important source of cost advantage among enterprise MDM vendors. Computer systems management vendors have over the years accumulated a significant body of knowledge about the marketplace, the customers and their preferences, allowing such companies to capitalize on previously acquired experience.

3.7.2   Customer Utility Advantages

There are a number of unique company assets, capabilities and characteristics that enable an organization to create greater value for its customers compared to other industry players.

3.7.2.1   Ability to innovate

The most important customer utility advantage is a company's ability to continuously

innovate and bring new value delivering products and sought-after product features to market.

It is important to note that the amount of R&D spending does not directly relate to the

innovation ability of an organization. A recent study by Booz & Company indicates that there is

no direct correlation between how much a company spends in R&D and how innovative it is

perceived to be. Table 6 below presents the top 10 companies that were perceived as the most

innovative by executive survey respondents in 2010. Only three companies from the top 10 in

R&D spending, Microsoft, Samsung and Toyota, made the top 10 innovative list. Apple topped

the innovation list despite the fact that it ranked 79th in R&D spending (Booz&Company, 2011).

Table 6 - The 10 Most Innovative Companies According to Booz & Company's 2010 Annual Survey.

	Company	R&D Spending		
		2010 $US M	Rank	% of Sales
1	Apple	$1,782	79	2.70%
2	Google	$3,762	34	12.80%
3	3M	$1,434	86	5.40%
4	GE	$3,939	32	2.60%
5	Microsoft	$8,714	4	14.00%
6	IBM	$6,026	15	6.00%
7	Samsung	$7,873	7	5.90%
8	P&G	$1,950	61	2.50%
9	Toyota	$8,546	6	3.90%
10	Facebook	N/A	N/A	N/A

3.7.2.2   Product quality

Ability to consistently deliver products and services of high quality is the second most

important source of customer utility advantage. Enterprise customers want to be able to rely on a

product each and every time, making product quality very important. Product quality is a function

of multiple operational variables, such as superior quality assurance, great user experience

interface design leading to the product's ease of use, and great quality of promotional and technical documentation.

3.7.2.3 Ability to generate satisfied customers that promote the company

The next important source of advantage is the ability of some companies to stimulate their business-to-business customers to promote the company more effectively than satisfied customers of other companies do. For example, Microsoft's products might be as reliable as Apple's and can cost the same, and Microsoft has significantly more customers than Apple, yet Apple's business customers promote Apple's products more actively than those of Microsoft do. This ability may be attributed to a confluence of such factors as a company's culture that promotes ultimate customer satisfaction, customer messaging that is conducive to endorsement-related actions, product positioning, projected user persona and uniquely positioned product features.

3.7.2.4 Brand awareness

Brand awareness is another important source of advantage. In an emerging market of enterprise MDM, customers face a cohort of vendors offering multiple solutions. Strong brand awareness puts a company in such a new market at a significant advantage when compared to an innovative startup without any brand recognition. A customer that already owns a product from a specific vendor, or one who is otherwise familiar with the brand, is more likely to acquire a product from such a vendor, rather than purchasing a product from a virtually unknown organization. Organizations with greater brand awareness represent a lower risk, according to customers' perceptions.

3.7.2.5 Company size

Company size is also an important source of advantage. It grants not only obvious cost structure related benefits in terms of economies of scale and scope, but also creates additional customer utility by reducing the amount of perceived risk when dealing with an organization in a

new and actively developing market such as enterprise MDM solutions. Large companies are more likely to diversify their product portfolios and revenue streams, making them more viable and inherently less risky to deal with. When evaluating multiple MDM companies, enterprise customers want to be sure an MDM vendor will be around in a year or two and can survive the price-based competition and continue to invest in product innovation. Larger organizations are more likely to be perceived as low-risk business partners.

3.7.2.6 Transactional convenience

Transactional convenience is a function of the choices a company has made in terms of its distribution network, such as whether or not the company has an e-commerce outlet, or a large number of channel partners a customer organization can liaise with locally to evaluate and deploy product.

Transactional convenience adds customer utility when a customer evaluating multiple enterprise MDM solutions is more likely to purchase a solution that is available through the customer's preferred channel partner or system integrator, thus eliminating the need to set up another vendor in various purchasing systems, which would introduce a cohort of complexities such as credit provisions and communication overhead.

3.8 Relative Competitiveness Analysis

Instead of evaluating each and every one of the 26 previously reviewed companies, the present research will focus on evaluation of the company central to this study and its five most relevant direct competitors that have already added MDM capabilities to their product portfolio, and which represent computer systems management solution providers. Absolute Software and Microsoft are both developing their MDM-related core competencies internally. Numara Software, Symantec and McAfee have added enterprise MDM capabilities through acquisitions of

pure-play MDM manufacturers (see "Table 4 - Recent MDM-Related M&A Activity." on page 21 above).

All six companies have already established comprehensive and diversified product portfolios and revenue channels, effectively benefitting from economies of scope and learning-related sources of advantage in equal fashion. This is why the competitiveness assessment matrix in Table 7 below features only customer utility-related sources of advantage.

Table 7 - Relative Competitiveness Assessment Matrix.

Criteria	Weight	Company	Absolute Software	Numara Software (BMC)	Symantec	McAfee	Microsoft
Ability to innovate & R&D effectiveness	25%	2	2	3	4	3	5
Product quality	20%	4	4	4	4	3	3
Satisfied customers	15%	4	3	3	2	3	2
Brand awareness	15%	2	2	3	4	5	5
Company size	15%	2	3	2	5	4	5
Transactional convenience	10%	3	3	3	5	4	3
Percentage	100%	56.00%	56.00%	61.00%	79.00%	71.00%	79.00%
Rank		5	5	4	1	3	1

Scoring:
- 5 - Excellent
- 4 - Good
- 3 - Average
- 2 - Below Average
- 1 - Poor

Note: The individual weights applied to criteria elements and actual assessment of the industry participants are subjective and based on the author's comprehensive research and personal industry experience.

3.9   External Analysis Summary

The enterprise MDM industry has a rich history and is presently assessed by Gartner to be around $300M a year. It has been developing since its inception in the early 1990s, and is currently going through a revolutionary stage of high growth and dynamic change in its lifecycle.

A series of network outages and failure to execute at Research in Motion, compounded by an explosion in BYOD and an abundance of inexpensive and functional mobile devices from smartphones to tablets, ignited a massive expansion and a flurry of activity in the enterprise MDM space.

There are numerous players within the MDM industry value chain: pure-play MDM software solutions manufacturers, TEM suppliers, network management and security providers, and large computer systems management solutions manufacturers.

With the influx of company- and employee-owned devices in an enterprise, computer systems management providers face pressure from customers and prospects to not only address the needs of management of large numbers of computers, but to securely and effectively manage their mobile devices running disparate operating systems.

Reacting to increased customer demand, many computer systems management manufacturers are actively entering the market of enterprise MDM solutions. While some industry participants enter the industry through acquisitions (Symantec), others choose a non-equity alliance alternative and add enterprise MDM capabilities to their existing product portfolios through licensing agreements (Lumension). There are industry players that have chosen to explore the third option of building an enterprise MDM offering in-house. These three distinct strategic alternatives to bring a MDM customer offering onboard will be evaluated in greater detail in Chapter 4 - Strategic Alternatives.

Financial services, government, healthcare, legal and professional services, education and retail constitute the main vertical markets that acquire MDM technologies most actively; only the healthcare and education industries are expected to grow in the short term.

Since mobile operating system manufacturers enable different sets of functionalities to be used for enterprise device management, various MDM manufacturers deliver very similar sets of

functions on the same platform, but struggle in offering an equal feature set across multiple platforms.

The MDM customer base is maturing and expects the following product features as part of an MDM offering: cross-platform support, real-time inventory, self-service portals, OTA configuration, mobile application management, selective data wipe, and URL and content filtering.

Although the degree of rivalry in the industry is high at the moment, it is expected to subside to moderate as the industry concentration increases in the future and MDM functionality becomes a commoditized part of computer lifecycle management.

In addition to economies of scope and learning, computer systems software manufacturers can capitalize on such sources of advantage as ability to innovate, product quality, ability to convert customers to company advocates, brand awareness, company size, and transactional convenience in order to succeed in the marketplace.

Table 8 below displays a summary of the company's SWOT when evaluated for potential entry into the enterprise MDM software solutions industry.

Table 8 - Company SWOT Summary.

Strengths	Weaknesses
• Economies of scope • Economies of learning • Strong quality assurance • Good customer service • Positive brand image • Large customer base	• Small company size • Low brand awareness • Failure to continually innovate
Opportunities	Threats
• High-growth MDM market • Existing computer systems management customers require an MDM offering • Growth of distribution network	• Losing time to market • Competitors from systems management space are entering MDM, putting the core business of computer systems management in the future at risk

4: Strategic Alternatives

The company's existing customers demand MDM capabilities, and, in order to remain competitive in the marketplace, the company has decided to add enterprise MDM capabilities to its product portfolio. The external industry analysis described in the previous chapter identified three distinct strategic alternatives for the company to add enterprise MDM capabilities to its existing computer systems management offering, often referred to as "build, buy, or partner" in product management literature. This chapter will review in greater detail how the company can develop such capabilities internally, or acquire a pure-play MDM manufacturer, or enter into a non-equity alliance with an established MDM manufacturer, which possesses an SDK for a streamlined integration of the MDM offering into the company's existing computer management framework.

4.1   Alternative 1 – Develop MDM in-house

The first strategic alternative for the company is to develop the necessary enterprise MDM capabilities in-house. The company has an established operational framework and organizational structure in place, which can potentially support software product development for mobile devices as well. By bringing MDM development in-house, the company will significantly benefit from economies of scope in product management, sales and marketing, as the addition of enterprise MDM-related responsibilities will result in a marginal increase in resource requirements for these functions.

The two areas of concern when bringing MDM development in-house are actual software development and quality assurance functions. Mobile software development experiences faster development cycles, utilizes special software development tools, and requires knowledge of

technologies that are drastically different from those used in desktop or server software development. These new software development capabilities and skills are not present at the moment and will need to be acquired by the company, and integrated within the existing processes and workflows.

Quality assurance is another factor of significant concern, as in addition to established protocols for unit, functional and regression testing typical of a desktop software quality assurance function, the testing protocols for the enterprise MDM will need to be created from scratch. The company has no prior expertise in mobile software product quality assurance and will need to build this expertise, integrate new test cases and workflows within the existing quality assurance framework, and maintain the established high product quality standards. The addition of cross-platform in-house MDM functionality testing, coupled with multiple localizations further burdened by a variety of device form factors, will add extreme complexity and organizational overhead to the quality assurance function.

4.2   Alternative 2 – Non-equity licensing alliance

A strategic non-equity alliance is the second option for the company to add the enterprise MDM offering to its current product portfolio. Within the framework of such a bilateral alliance, the company and a pure-play MDM manufacturer develop a contractual relationship to share and exchange certain resources and capabilities in order to create a competitive advantage for both firms. The company obtains proven MDM management technology and the MDM manufacturer creates a new revenue channel through a licensing agreement, and gains access to a larger customer base as well as the company's sales and marketing resources.

Licensing-based non-equity alliances represent a popular form of partnership in the technology field. Such partnerships allow the licensor to scale its distribution network while

maintaining control over generated intellectual property, and enable the licensee to access such knowledge and commercialize it, without actually acquiring that innovation.

A key success factor for relationships represented by the second strategic alternative is the availability of an established and well document Software Development Kit (SDK) or a set of articulated APIs an MDM vendor can provide the company with. An SDK significantly lowers integration and quality assurance costs; it encapsulates the licensed product capabilities and provides a framework for seamless integration with the company's computer systems management solution.

When engaging in a licensing partnership adverse selection, moral hazard and holdup situations can arise and need to be considered carefully before such a partnership is formed. Adverse selection arises due to asymmetric information, where partners may have access to different information, resulting in suboptimal benefits. Moral hazard often manifests itself in a business relationship where one party is more likely to take higher risks if another party absorbs the costs. Holdup is another common partnership problem, where a change in the balance of bargaining power, for example, after a significant transaction-related investment such as an expensive marketing campaign, may result in significant margin attrition and loss of benefits for the party that has made such an investment.

4.3   Alternative 3 – Acquire a pure-play MDM manufacturer

Another alternative to add enterprise MDM capabilities to the company's product portfolio is to acquire a pure-play MDM manufacturer in order to integrate the already established and proven MDM technology within the company's tested systems management framework.

MDM acquisition strategy is a relatively popular choice in the marketplace. Symantec, McAfee and Numara Software have selected this strategy to offer MDM capabilities.

There are a number of pure-play VC and private equity backed pure-play MDM manufacturers that represent attractive acquisition candidates. Such companies as Capricode, FancyFon, Fixmo, IBELEM, MobileIron, The Institution or SOTI might potentially be acquired for their MDM technology for further integration with a systems management platform.

In an acquisition scenario, the company will acquire a pure-play MDM player and integrate the new technology within the established organizational structure, allowing the company to benefit not only from economies of scope, but also from economies of learning and accelerated time to market with a new product driven by proven technology.

Although acquisitions are often used for company growth and product portfolio expansion, this method represents a very risky strategy. A large body of acquisition-related research suggests a very high acquisition failure rate. Multiple studies over the last 75 years of corporate history suggest that at least half of mergers and acquisitions fail to create their expected value (Shapiro, 2010).

Further analyses of shareholder returns at merged companies show that such companies on average fail to outperform their non-merging peers; in fact, they perform worse than prior to the merger. Such studies also indicate that profitability for the merged entity typically declines in the post-merger period, and productivity follows this negative trend. In addition to profitability and productivity degradation, there is evidence of significant post-merger leadership attrition, reducing companies' competitive advantage and innovation capabilities (Tuch & O'Sullivan, 2007).

While post-merger costs, comprising one-time acquisition and ongoing integration and coordination costs, are typically higher than expected and forecasted pre-merger, firms often need to adjust their assimilation plans, leading to delayed implementation, and as a result there is postponed realization of the benefits of targeted synergies.

Another area of concern is an acquisition's valuation. Depending on projected synergies, target valuations can vary significantly. Winner's curse is a clear and present danger in any acquisition scenario. The winning bid, resulting in an acquisition's bidding victory, is higher than valuations by all other participating bidders, which are on average correct, thus representing the most optimistic valuation, which is on average wrong.

4.4   Evaluation of Alternatives

In this section above identified strategic alternatives will be assessed against such criteria as expected product performance, effect on the company's capital structure, the degree of risk, how fast an enterprise MDM solution can be brought to market, and how extensive coordination is going to be when implementing a particular alternative.

4.4.1   Product performance

Great product performance is rooted in advanced technology, motivated and knowledgeable human capital, and superior quality assurance. Although great product performance negatively impacts the source of cost advantage, it differentiates the company through better user experience and higher customer satisfaction, creating greater customer value. Proven MDM technology from an existing vendor via a licensing agreement or an acquisition will result in a product that performs significantly better compared to an in-house developed product, because the company will have to climb the learning curve of the new technology and accumulate the necessary body of knowledge and experience. While the feature set is being gradually expanded and software code deficiencies are identified and eliminated by an in-house team, third-party technology will have experienced the typical growing pains of an emerging solution, allowing for better product performance at the launch stage.

4.4.2 Effect on capital structure

The company is privately held and has virtually no debt. Company ownership perceives any increased leverage via debt as a very risky approach, thus limiting the company's ability to finance its growth. All retained earnings are distributed among the partners annually, further limiting any internal sources of funding for company's advancement. The company typically extends its accounts payable and simultaneously aggressively manages shorter accounts receivable periods to generate working capital. If the company starts to develop the enterprise MDM capabilities in-house, the effect on its capital structure will be minimal as the changes are going to generally affect the development payroll numbers, thus significantly limiting its effect on the company's financial position, where a licensing agreement will have a more pronounced effect in the form of certain capital commitment provisions, such as dedicated promotional spend or an upfront payment for the right to use the SDK. The acquisition option will have the greatest negative impact on the existing capital structure as it will require the company to use a significant amount of capital and increase its leverage and debt position to execute an acquisition.

4.4.3 Product quality risk

Any major new product initiative carries a certain degree of risk that the product is not going to perform according to initial expectations. The three alternatives vary significantly by the magnitude of product quality risk they expose the company to. The in-house development and acquisition options represent the least risky alternatives, because in both cases the company always remains in total control of product quality and all product elements, from interface and user experience design to architectural composition of functional modules with the product, naturally enabling the company to enforce its high quality standards on the new product. A licensing agreement, on the other hand, is more risky as it introduces a new business party that is in charge of the core technology that is being made available to the company. Core product functionality issues that reside under the control of a third party, whose quality standards might

be lower than those of the company, can expose the company to greater product quality risks, as the quality assurance capabilities of the company in this scenario are limited.

4.4.4   Time to market

The three alternatives will allow the company to launch its MDM offering within different amounts of time. The fastest to-market option is that of licensing existing technology from a third party through a non-equity alliance. A well-documented SDK can be quickly integrated to deliver customer value, whereas an acquisition scenario will take longer because of the necessary due diligence that must take place before an acquisition can be executed. In-house MDM development will take the longest amount of time to bring the enterprise MDM capabilities to the company's customer base.

4.4.5   Coordination overhead

Each option has a different amount of coordination overhead associated with it. The in-house option requires extra coordination to acquire numerous new team members and organize the new team. The licensing alternative increases the coordination overhead more significantly as it introduces a more intensive coordination overhead with a new business partner on an ongoing basis. The acquisition route results in the most amount of coordination overhead, where one-time complex coordination efforts of valuation, regulation, financing and legal functions involving multiple third parties are augmented by oftentimes underestimated ongoing coordination and integration efforts.

4.4.6   Evaluation summary

Table 9 below illustrates a summary of how the three alternatives are evaluated against the criteria discussed above on a scale from one to five, one being poor or low, and 5, carrying an excellent or highest assessment. The licensing alliance option ranks the highest in this assessment.

Table 9 - Evaluation of Alternatives.

Criteria	Weight	In-house development	Licensing Alliance	Acquisition
Product performance	25%	3	4	4
Capital structure effect	25%	4	3	2
Product quality risk	20%	4	3	4
Time to market	15%	1	4	3
Coordination overhead	15%	4	3	2
Percentage	100%	66.00%	68.00%	61.00%
Rank		2	1	3

Scoring:

5 - Excellent / Highest
4 - Good
3 - Average
2 - Below Average
1 - Poor / Low

Non-equity based alliances such as licensing agreements are often used as stepping-stones towards an acquisition in the future. The decision whether to ally or to acquire, or in the case of the company "whether to ally first and acquire later, or acquire right away," can be assessed by evaluating existing conditions across such factors as type of synergy between the two companies, nature of consumed resources, the extent of redundant resources that are being used by either company, the degree of market uncertainty and level of competition in the field (Dyer, Kale, & Singh, 2004).

When bringing a new enterprise MDM product offering to its customer base, the company is interested in managing resources independently and only pooling the results for greater profits, as opposed to working closely together (reciprocal synergies), or sequentially independent (sequential synergies). The modular synergy requires the least amount of coordination and customization.

The nature of resources parameter refers to the ratio of soft resources such as human capital to hard resources such as tangible company assets, when evaluating an acquisition decision. In a scenario of acquiring the MDM capabilities by the company, the nature of such resources in a non-equity alliance is lower than in an acquisition scenario, as no actual resources will ever be acquired; even the underlying intellectual property will be retained by the original MDM developer.

The extent of redundant resources refers to the amount of redundant resources each company is going to utilize when working together. A non-equity licensing agreement demonstrates a significantly lower degree of redundant resources compared to an acquisition scenario. In a licensing scenario the only potentially redundant resource is going to be represented by the quality assurance function, as the solution-generating party needs to make sure the licensed product meets quality standards, and the company will have to confirm the quality of the product through its own independent quality assurance mechanisms.

Collaboration between different companies is inherently risky, and the degree of risk can vary significantly depending on the nature of collaboration. The fast-paced enterprise MDM industry is evolving very quickly, presenting a very high degree of risk and uncertainty, and thus favoring an acquisition scenario.

Level of competition refers to the degree of competition for resources in a specific industry. The enterprise MDM industry enjoys a high level of competition, making an acquisition a preferred alternative within this assessment parameter.

A summary of strategic factors described above assesses a non-equity-based alliance more favorably than an acquisition.

Table 10 demonstrates the superiority of a licensing option over an acquisition under present circumstances for the company, further underlying the potency of the licensing alternative.

Table 10 - Evaluation of a Non-Equity Alliance vs. an Acquisition.

Factor	Strategy	
	Non-equity Alliance	**Acquisitions**
Synergy type	Modular (1)	Reciprocal
Nature of resources	Low (1)	High
Extent of redundant resources	Low (1)	High
Degree of market uncertainty	Low	High (1)
Level of competition	Low	High (1)
Score	**3**	**2**

Legend
Applicable factor (1)
Non-applicable factor

5: Feasibility Analysis

5.1   Feasibility Analysis of Strategic Alternatives

The feasibility analysis of identified strategic alternatives will evaluate the three strategic options based on how aligned they are with the current managerial preferences, organizational capabilities and available resources. This exploration results in identification of multiple potential gaps with varying degrees of severity, and presents remediation vehicles if available.

5.1.1   Alternative 1 – Develop MDM In-house

5.1.1.1   Management Preferences

The analysis of management preferences reveals whether or not the identified option aligns with experience, relevant capabilities and ethical worldviews of company leadership. Although the in-house development alternative does not contradict the preference of the CEO, it demonstrates some minor gaps with the preferences of the board, CEO, and middle management. A detailed business plan with cash flow projections, ROI estimates, primary and secondary market research, evaluation of risk factors, and formulation of key performance indicators will bridge the gaps between required and existing management preferences.

Table 11 presents the management preferences for the in-house MDM development option evaluation in greater detail.

Table 11 - Management Preferences Evaluation for Option 1.

Legend
No gap
Minor gap
Insurmountable gap

Role	Required Preference	Existing Preference	Gap	Solution
Board	Interest in investing in expansion of current product portfolio with an MDM offering.	No investment in new products, annual distribution of all retained earnings as dividends.	Investment in extra development resources to produce the MDM offering.	Compelling business case with a rapid ROI and short time to market.
CEO	Desire to diversify current revenue streams and reduce dependence on one mature flagship product.	Interest in growing revenue from non-flagship products and new verticals.	None.	None.
COO	Commitment to integrating MDM-related resources and processes into existing structures and frameworks.	Exclusive focus on the flagship product. All other initiatives delegated to subordinates with insufficient experience and authority.	Lack of dedication to integration of MDM-related resources, potential abandonment and de-prioritization.	Compelling business case and full buy-in for long-term (two years+) support and ownership of the MDM rollout initiative via KPIs.
Middle Management	Experience in MDM industry landscape.	Very limited exposure to MDM industry.	Lack of industry understanding and experience.	Sharing results of MDM market research and knowledge transfer from internal champions in product management.

5.1.1.2   Organizational Capabilities

The organizational capabilities of the company are ill-fitted for in-house MDM offering development. While new development resources can be acquired, re-assigned and integrated within the existing organizational structure, the company is presently incapable of quickly

establishing a deep expertise in complex and technically challenging backend infrastructure management that is required by the MDM functionality at the company's high levels of service availability and superior customer satisfaction. While the existing product portfolio would benefit from the capabilities to manage such a complex backend infrastructure, those are not *required* outside the MDM context, but are *essential* when adding MDM capabilities.

A detailed evaluation of organizational capabilities and a pernicious gap in backend infrastructure capabilities are presented in Table 12.

Table 12 - Evaluation of Organizational Capabilities for Option 1.

Required Capability	Existing Capability	Gap	Solution
Quickly acquire MDM technology knowledge	No MDM development capabilities are present.	Acquire a team of MDM developers.	Utilize offshore programming partner that has a larger pool of resources and access to a larger body of knowledge, including MDM development.
Ability to rapidly integrate a new team	Product development team experience natural flux in between resource-heavy product releases.	None.	None.
Ability to launch new products	The company has extensive experience in launching new products on the same platform.	No new products have been launched for a new platform for a long time.	Detailed launch plan involving every organizational aspect.
Ability to create and maintain sophisticated backend infrastructure	Existing systems management platform is maturing, but required backend infrastructure is not available.	Capabilities to create and maintain complex backend infrastructure for the MDM offering.	Not available. Missing due to capital intensity and technological complexity.

5.1.1.3   Resources

Evaluation of resources determines whether or not the company's human, operational, and financial resources are sufficient and aligned with the option in question. In-house MDM

development fails this fit evaluation, thus invalidating the option of creating an enterprise MDM product offering in-house.

Although the company can benefit from economies of scope in sales and marketing, has plenty of office space to accommodate the new resources, and can create the necessary intellectual property and knowledge, the requirement for a significant increase in development resources to build the MDM development expertise and create a product from scratch creates a fatal gap for this option.

A total of at least five new development and two quality assurance resources are required for a duration of nine months to a year to create and integrate the initial version of the MDM offering. This investment constitutes an incremental research and development budget increase of over CAD $600K. This approach directly violates the existing management preferences of the board and requires financial resources that are unavailable.

A complete summary of organizational resources and option's failure to satisfy the budgetary constraint are presented in Table 13.

Table 13 - Evaluation of Resources for Option 1.

Required Resources	Existing Resources	Gap	Solution
Marketing the MDM solution to existing customers and new prospects	Multiple products are marketed, new releases are launched regularly.	None.	None.
Dedicated and knowledgeable MDM development resources	No dedicated MDM development resources or expertise are present.	MDM developers.	Acquire MDM development resources through an established offshore development partner with existing MDM development capabilities.

Required Resources	Existing Resources	Gap	Solution
Extra office space	Plenty of space in Vancouver offices. The capability is present with potential offshore development providers as well.	None.	None.
Extra budget ($600K) to acquire MDM development resources	Further growth of development budget has been rejected by CEO and the board.	Extra capital to acquire MDM development resources for a long-term engagement.	Not available. Unlikely to be approved due to budgetary constraints.

5.1.2 Alternative 2 – Non-equity licensing alliance

5.1.2.1 Management Preferences

The option of establishing a licensing partnership with a pure-play MDM manufacturer to bring to market a new MDM offering generally aligns with existing management preferences. Taking into consideration the board's propensity for distributing all retained earnings and wiping out any capital for investment in new products, a comprehensive business plan for the new product offering will bridge the gap of missing willingness to invest in the initial acquisition of the MDM SDK or access to APIs and the marginal increase in development resources to integrate the new technology. While the detailed cash flow forecast, rapid ROI projections, and careful risk assessment can bridge the preference gap of the board, a pivotal segment of the business plan, an all-encompassing marketing plan, will address the minor gaps in preferences of the COO and middle management by designing a set of key performance indicators for initiative champions and internalizing knowledge of the MDM market through the communication of primary and secondary marketing research.

Table 14 presents the management preferences for the non-equity licensing alliance option evaluation in greater detail.

Table 14 - Management Preferences Evaluation for Option 2.

Role	Required Preference	Existing Preference	Gap	Solution
Board	Interest in product portfolio diversification and new revenue streams.	Maximization of annual dividend payout limiting potential investments in new products.	Willingness to invest in acquisition of SDK and extra resources for MDM integration and launch.	Compelling business case with a rapid ROI and short time to market.
CEO	Desire to diversify current revenue streams and reduce dependence on one mature flagship product.	Interest in growing revenue from non-flagship products and new verticals.	None.	None.
COO	Commitment to fostering a partnership with pure-play MDM SDK provider-related resources and processes into existing structures and frameworks.	Exclusive focus on the flagship product. All other initiatives get delegated to subordinates with insufficient experience and authority.	Lack of dedication to integration of MDM-related resources, potential abandonment and de-prioritization.	Compelling business case and full buy-in for long-term (two years+) support and ownership of the MDM rollout initiative tied to key performance indicators.
Middle Management	Experience in MDM industry landscape.	Very limited exposure to MDM industry.	Lack of industry understanding and experience.	Sharing results of MDM market research and knowledge transfer from internal champions in product management.

5.1.2.2   Organization

The second option mostly aligns with the organizational capabilities of the company. While the company already has SDK integration experience and an ongoing relationship with a technology partner to manufacture its anti-virus product and is capable of extending the relationship framework to a MDM SDK provider, two minor gaps were identified: the ability to design and execute successful and meticulously planned product launch initiatives, and capabilities to acquire experience and knowledge to create and manage a backend infrastructure of significant technological complexity to support the new product infrastructure.

While the first gap of product launch planning capabilities can be addressed through capitalizing on the company's previous experience in successfully launching SDK-based products, the second gap, the company's ability to design and establish a complex backend infrastructure to support the new MDM offering, presents an opportunity to leapfrog the company's present technology and use the SDK provider's middleware infrastructure and experience to offer the new MDM product and consequently adopt the new framework with other of the company's products.

A detailed evaluation of organizational capabilities for a licensing partnering option is presented in Table 15.

Table 15 - Evaluation of Organizational Capabilities for Option 2.

Required Capability	Existing Capability	Gap	Solution
Ability to scale resources up quickly for SDK integration into new product offering.	SDK integration capabilities and experience already exist. The company has an SDK partner it delivers its anti-virus offering with.	None.	None.
Ability to design, coordinate and execute launches of new products.	The company has extensive experience in launching new products on the same platform.	No new products have been launched for a new platform for a long time.	Detailed launch plan involving every organizational aspect building on previous experience and success with SDK-based product.
Ability to design, implement and maintain a sophisticated backend infrastructure.	Existing systems management platform is maturing, but no required backend infrastructure is available.	Capabilities to create and maintain complex backend infrastructure for the MDM offering.	MDM SDK partner's infrastructure, experience and capabilities can be used for hosted and SaaS delivery.

5.1.2.3 Resources

The SDK option demonstrates a high degree of alignment with the current resources of the company. The launch of the MDM offering will allow the company to benefit from

economies of scope, offering an additional product to the existing customer and prospect base through established sales and marketing channels.

The required financial resources to acquire the SDK are estimated to be approximately $50,000. This amount represents an amount that is routinely budgeted for within the research and development budget for exploration of new technologies. A comprehensive business case depicting a positive cash flow and rapid ROI will guarantee the release of SDK acquisition investment funds. No board approval is required for an investment at such a minimal level.

Table 16 depicts a pronounced alignment between the existing and required organizational resources within the context of a partnering option.

Table 16 - Evaluation of Resources for Option 2.

Required Resources	Existing Resources	Gap	Solution
Marketing the MDM solution to existing customers and new prospects	Multiple products are marketed; new releases are launched regularly.	None.	None.
Extra budget to acquire MDM SDK, typically ~$50K	Technology investment is budgeted and awarded based on a business case and ROI.	<$50K SDK acquisition investment.	New technology investment decisions at this minimal level do not require board's approval. The budget is approved based on a business case.

5.1.3   Alternative 3 – Acquire a pure-play MDM manufacturer

5.1.3.1   Management Preferences

The acquisition option is in sync with the CEO's desire to diversify current revenue streams and lower the company's dependency on revenues from its single flagship product. It is important to note that the main flagship product in the company's product portfolio is a result of an acquisition that took place over 10 years ago. The company was first awarded distribution rights for what later became the company's main product. The first and only acquisition in the

company's history was championed and executed by the current CEO. No further acquisitions were attempted.

Further analysis reveals two minor gaps in management preferences: the COO's potential lack of dedication to integrate the target company after acquisition, and a profound lack of MDM industry expertise among middle management, which will have to be addressed post-acquisition to provide a seamless operational integration.

A comprehensive business plan can bridge both gaps. A coordinated integration strategy and elaborate action plan can delegate key stakeholders, including the COO, to guarantee engagement and charter a set of key performance indicators to manage individual performance, while another integral part of the business plan, marketing research, can be communicated to middle management across the company to raise the level of MDM marketplace awareness.

The option, however, fails when evaluated against the board's management preferences. The preference of the board is to distribute all retained earnings as annual dividends. An acquisition will significantly reduce the amount of dividends, or force the board to forego dividends completely due to acquisition in either a cash- or equity-based transaction scenario.

Table 17 exhibits further details of management preferences for this option.

Table 17 – Evaluation of Management Preferences for Option 3.

Role	Required Preference	Existing Preference	Gap	Solution
Board	Commitment to investment in an acquisition and reduction of annually distributed dividends.	No investment in new products, annual distribution of all retained earnings as dividends.	Investment in an acquisition and willingness to limit dividends.	None.
CEO	Desire to diversify current revenue streams and reduce dependence on one mature flagship product.	Interest in growing revenue from non-flagship products and new verticals.	None.	None.

74

Role	Required Preference	Existing Preference	Gap	Solution
COO	Commitment to integrate the acquired resources.	Exclusive focus on the flagship product; all other initiatives get delegated to subordinates with insufficient experience and authority.	Lack of dedication to integration post-acquisition.	Compelling business case and full buy-in for long-term (two years+) support and ownership of the MDM rollout initiative tied to key performance indicators.
Middle Management	Experience in MDM industry landscape.	Very limited exposure to MDM industry.	Lack of industry understanding and experience.	Sharing results of MDM market research and knowledge transfer from internal champions in product management.

5.1.3.2 Organization

The feasibility analysis of the company's organizational capabilities exposes three minor gaps: dealing with internalization of MDM technology knowledge, increase in complexity of spatial coordination with addition of new office locations, and capacity to orchestrate sophisticated backend infrastructure.

The new MDM technology knowledge will need to be effectively integrated within the existing development paradigm. Although the company has experience in internalization of new knowledge (for example, it added a Macintosh platform development capability over five years ago), integration of the acquired development team might represent an operational and cultural challenge. The existing development management team should include members of the acquired team to avoid a possible clash of different cultures, which could cause exit of talent and integration inefficiencies.

It is entirely possible that the target company resides elsewhere and the level of coordination complexity of multiple office locations can represent a significant challenge to the

company's operational efficiency. The existing capabilities of spatial coordination stem from the company's experience in setup and management of offices in Canada, the United States, and the United Kingdom. The challenge of integrating the target organization's locations presents an interesting opportunity to expand the company's spatial footprint without investing in the initial setup of new outposts, where the acquired offices can provide additional benefits by extending the synergies to sales, marketing and support functions, allowing the company to scale all of its unified resources across the entire aggregate functional footprint.

The third capability gap is represented by currently unavailable faculty to create and maintain a sophisticated backend infrastructure. This serious gap also creates an opportunity for the company to attain such capabilities with the acquisition, as in order to deliver the MDM offering, the target organization will have those already established. Once the backend infrastructure is acquired, the knowledge transfer process will internalize this capability and expand its functionality beyond the MDM offering to the company's other products.

Table 18 further details the analysis of organizational capabilities for this strategic alternative.

Table 18 – Evaluation of Organization Capabilities for Option 3.

Required Capability	Existing Capability	Gap	Solution
Integrate the acquired MDM technology knowledge within existing product portfolio.	Limited experience in integration of new platform technologies exists, based on expanding the product portfolio onto the Macintosh platform.	Integrate the new development team within the existing development organization.	Expand development management to include the newly acquired team in addition to existing in-house and offshore development.
Ability to rapidly integrate the new team residing elsewhere.	Company resources are coordinated between three offices in the US, Canada and the UK.	Integrate the acquired team potentially located elsewhere.	Organize as a new office location, presenting synergies in sales and marketing in addition to development.

Required Capability	Existing Capability	Gap	Solution
Capabilities to maintain the backend solution middleware infrastructure.	Existing systems management platform is maturing, but hosted and SaaS infrastructure options are not available.	Capabilities to provide hosted and SaaS infrastructure for the MDM offering.	Backend middleware management capabilities are acquired with other company's assets and will be internalized.

5.1.3.3 Resources

Further invalidating this option, the feasibility analysis of the company's resources identifies the acquisition option as a non-viable alternative, compounded by insurmountable gap in the board's management preferences as identified earlier. Although the necessary distribution resources are already available and the required MDM development resources and knowledge can be internalized post-acquisition, it is the capital requirement to fund the acquisition that abrogates this strategic alternative.

The combination of the practice of annually distribution of all retained earnings as dividends and the company's approach to providing working capital through arbitrage of shorter accounts receivables and extended accounts payables, paints an unfavorable picture for the company as a potential fund-raiser. The fact that the company has very limited fixed assets further lowers its attractiveness for a potential lender. It is extremely unlikely that under present circumstances the company will be able to raise any significant amount of capital to fund a cash-based acquisition.

The current operational finance practice that serves the short-term-focused goals of drawing maximum annual dividends and therefore sacrifices company's growth and advancement has a devastating effect on its valuation in an equity-based acquisition scenario. Company valuation for such equity-backed acquisition will be heavily discounted, making such acquisition extremely unlikely to ever succeed.

Table 19 offers greater detail of resource analysis for this strategic alternative.

Table 17 - Evaluation of Resources for Option 3.

Required Resources	Existing Resources	Gap	Solution
Marketing the MDM solution to existing customers and new prospects.	Multiple products are marketed, and new releases are launched regularly.	None.	None.
Dedicated and knowledgeable MDM development resources.	No MDM development expertise is present.	Acquire MDM development capabilities.	Obtain MDM development resources through an acquisition of a pure-play MDM vendor.
Capital to acquire the pure-play MDM vendor.	Very limited fixed assets. All retained earnings distributed as dividends. Minimal working capital.	No capital or credit to raise funds for an acquisition.	Equity-based acquisition. Very unlikely to succeed due to low valuation.

5.2   Preferred Alternative

The feasibility analysis above reveals that the option to establish a non-equity based alliance through a licensing agreement for an SDK or a set of APIs is at the moment the only viable alternative for the company to pursue in order to add enterprise MDM capabilities to its existing product portfolio.

The preferred alternative establishes a bilateral alliance with a licensing framework, a popular method within the technology field, and creates competitive advantage for both participants. The MDM technology licensor acquires a larger customer base through a new revenue channel, and secures its intellectual property ownership and interests by a licensing framework. The company, on the other hand, benefits from economies of scope and learning to launch a new product offering without inventing the underlying technology and the significant investment associated with such product development efforts.

This option perfectly aligns with the managerial preferences of the company's CEO to diversify revenue streams, and reveals minor gaps in the managerial preferences of the board, the COO and the company's middle management. These gaps can be remediated through

construction of a comprehensive business plan that identifies low potential risks in greater detail, and exposes the middle management to MDM industry landscape and research.

The licensing option is also in tune with organizational capabilities of the company. Although several minor gaps were identified, such as an ability to launch new products on new platforms and a learning curve to integrate the acquired SDK within the existing product technology stack, it also presents an opportunity to capitalize on the backend infrastructure that an SDK provider would have developed, instead of investing in development of such an infrastructure from scratch.

The evaluation dimension of resource requirements brings the superiority of the licensing option to shine. While two other alternatives fail this feasibility assessment, the licensing option demonstrates perfect alignment of required resources with those already at hand.

Table 20 depicts a summary of how the three evaluated alternatives fared against multiple evaluation dimensions, vividly indicating the licensing alternative as the only viable option.

Table 18 - Summary of Alternative Evaluations.

Evaluation Dimension	Alternative 1 In-house development	Alternative 2 License via MDM SDK	Alternative 3 Acquisition of an MDM vendor
Management Preferences	Passed	Passed	Failed
Organization Capabilities	Failed	Passed	Passed
Resources	Failed	Passed	Failed
Verdict	**Not viable**	**Viable option**	**Not viable**

6: Potential Alliance Partner Evaluation

A preliminary research into the leading enterprise MDM solutions manufacturers has identified nine potential contenders capable of entering into an SDK- or API-based licensing agreement with the company in order to create a branded MDM product offering within a non-equity-based alliance framework. These companies represent a very heterogeneous selection of solution providers. This is why a set of weighted criteria will be equally applied to evaluate each and every potential contender. Each potential partner is evaluated against six distinct criteria on a scale from one to five, five representing the highest rating, and one, the lowest.

6.1　Company viability

The enterprise MDM industry is evolving very quickly and it is important to build a long-term alliance with a company that is viable and can sustain rapid changes in a dynamic industry without collapsing. This is why company viability has the highest weight of 25% and is largely based on a company's track record, number of employees, and in the case of publicly held companies, financial performance. Good Technology and Tangoe are the most viable contenders in terms of viability. Both companies have a good track record, have grown considerably over the years, and created diversified product portfolios catering to multiple customer segments. Odyssey Software, although a very strong contender on other evaluation criteria, fails this evaluation factor due to its recent acquisition by Symantec, making the high quality SDK based on robust underlying MDM technology no longer available for integration by third parties.

6.2   Quality of SDK and underlying MDM technology

Two quality-related evaluation factors are at play in this relative assessment: the quality and maturity of the MDM technology a potential partner has developed, and the quality of the actual SDK or API offering. While the core underlying MDM technology might build a company's distinctive competence, a weak SDK will put a potential partner at a disadvantage by limiting the company's potential to capitalize on a partner's outstanding underlying technology. Commitment to providing high quality products that generate great customer satisfaction is deeply embedded within the company's soft tissue and its culture, which is why quality-related evaluation criteria occupy such prominent positions within this relative position analysis. In a technological alliance the quality of the offering the company will consume, i.e., the SDK, is weighted more heavily at 25%, compared to 20% the core MDM technology quality carries. AirWatch, Good Technology, MobileIron and Odyssey Software offer the highest quality of well-rounded enterprise MDM technology. These companies also score highly on the quality of their SDK products, although the quality of the SDK and APIs are generally lower than that of the underlying technology. The SDK and API business lines are significantly more recent and have not yet been developed to provide the same level of quality and maturity that the core MDM technology demonstrates.

6.3   Customer satisfaction

Customer satisfaction is another important evaluation criterion that is aligned with the company's source of competitive advantage. Carrying a weight of 15%, this evaluation parameter allows for an alignment with a technology partner equally striving for greater customer satisfaction, thus limiting a potential gap in organizational cultures when collaborating. The evaluation of this parameter is subjective and largely based on case studies available as marketing collateral from companies' websites, analyst reports, customer testimonials, and Internet

discussion boards. Larger North America-based companies tend to generate more positive customer feedback.

6.4   Breadth of features

The breadth of features evaluation criterion carries a weight of 10% and reflects partner's ability to provide a wide variety of enterprise MDM features. An ideal partner will have a great breadth of MDM features that are delivered through a high quality proven and tested technology, packed in a reliable and robust masterpiece of an SDK. In reality, the three components represent different variables that vary significantly from partner to partner. While smaller contenders specialize in narrow functionality sets, larger players are able to offer more comprehensive feature sets.

6.5   Executive management

The quality of executive management represents the final criterion of the relative assessment and carries a weight of 10%. Good Technology and Tangoe have mature and experienced management teams capable of navigating a rapidly changing landscape of enterprise MDM. MobileIron is backed by reputable venture capital companies and has expert management talent at the helm, capable of developing this pure-play MDM manufacturer into a strong and sustainable market player.

Although nine potential partners were originally identified, the list of partners for further technical evaluation will be reduced to the most probable partners that score within a certain consideration rating. For the purposes of this project, an 80% consideration rating is being applied, effectively identifying AirWatch, Good Technology and MobileIron as the three potential MDM SDK providers for further detailed technical assessment.

Table 21 provides an overview of individual assessments for the nine potential SDK providers and identifies the three contenders that score above the 80% minimal consideration rating threshold.

Table 19 – Evaluation of Potential SDK Providers.

Criteria	Weight	AirWatch	Capricode	FancyFon	Fiberlink	Fixmo	Good Technology	Mobile Iron	Odyssey Software	Tangoe
Company viability	25%	4	2	2	3	2	5	4	1	5
Quality of SDK /API	25%	4	2	2	2	2	4	4	4	3
Quality of MDM technology	15%	5	3	3	3	2	5	5	5	2
Customer satisfaction	15%	4	4	3	3	3	4	4	4	4
Breadth of features	10%	4	2	2	2	2	4	4	4	3
Executive management	10%	3	2	2	2	2	4	4	3	4
Percentage	100%	81%	49%	46%	51%	43%	88%	83%	66%	72%
Rank		3	7	8	6	9	1	2	5	4
Recommendation		Consider	Reject	Reject	Reject	Reject	Consider	Consider	Reject	Reject

Scoring:
Consideration rating = 80%
5 - Excellent / Highest
4 - Good
3 - Average
2 - Below Average
1 - Poor / Low

7: Final Recommendation

The enterprise MDM industry is in flux and grows at a healthy rate, presenting opportunities for existing and new entrants. With moderate barriers to entry and a high degree of rivalry in the industry further consolidation is likely, which will result in the entire field of enterprise MDM folding into the established industry of computer systems management, populated by larger oligopolistic vendors. Although the requirement to manage mobile devices through a single pane of glass and with the same set of tools is very new, it is being actively adopted by customers and responded to by systems management solutions manufactures. While the industry is maturing and technologies are being actively developed, the ability to manage mobile devices is used by computer systems management solutions manufacturers as a differentiating factor. Once the technology matures and industry concentration increases, the enterprise MDM capabilities will be commoditized and offered by any vendor expected to deliver computer systems management. This is why a timely addition of MDM capabilities to the existing product portfolio can enhance the company's ability to differentiate itself in the marketplace for the next two to three years and satisfy articulated demand among its already established customer base.

In the previous chapters of the present project, a situational analysis of the company's present position and performance was conducted and complemented by an external analysis of the MDM industry in general and key players in particular, resulting in the emergence of a triad of distinct strategic alternatives, to add an enterprise MDM offering to the company's product portfolio: develop the MDM offering in-house, acquire an existing MDM vendor, or license the MDM technology from a pure-play MDM manufacturer, often referred to as "Build, Buy or Partner" options. The three strategic alternatives were evaluated based on a number of weighted

factors, such as resulting product performance, effect on capital structure, the degree of risk, time to market effect, and the amount of coordination overhead associated with each option. The option of a non-equity alliance emerged as the most optimal alternative at this stage. Further feasibility assessment of the three options indicated that the leading option of a non-equity licensing partnership is the only viable alternative that satisfies the multi-factor options evaluation.

The strategic alternative of partnering with a pure-play MDM manufacturer and integrating existing and proven MDM technology through an SDK and a set of APIs in the company's new MDM product offering is the recommended option.

This particular option represents the most optimal choice for the company under present conditions. It aligns best with existing managerial preferences, capitalizes on existing organizational capabilities and can be executed with present resources available to the company, whereas the other two alternatives cannot.

While the recommended option fully aligns with the existing managerial preferences of the CEO, who aspires to reduce present dependence on revenue from the flagship product, which is leaving its maturity lifecycle stage into that of a decline, there are minor gaps between required and existing preferences of the Board, the COO and middle management. These gaps can be effectively addressed through a comprehensive business plan that further validates the recommended option and details primary and secondary marketing research to raise the level of MDM industry awareness among middle management. Such a business plan shall provide estimates of ROI and cash flow, along with key performance indicators to incentivize desired behavior, commitment and goals for the COO and middle management. A detailed risk profile will address the board's potential concerns and satisfy its risk tolerance.

The recommended option has demonstrated three minor gaps in organizational capability prerequisites: the ability to integrate a new piece of a third-party technology into the existing

product portfolio and frameworks, the ability to carefully coordinate successful launches of new products, and the capability to deliver the new service through a robust and flexible backend infrastructure. The company's experience with its anti-virus offering is conducive to remediating the first two gaps, where similar SDK integration processes can be followed with a minor increase in dedicated development resources, and an established product launch framework can be utilized when bringing the new MDM product to market. The last gap in organizational capabilities presents an opportunity for the company to address the lack of a hosted SaaS infrastructure offering by employing the existing infrastructure of the SDK provider.

The preferred option is in complete alignment with the existing resources. The necessary minimal investment in SDK acquisition can be easily financed out of the research and development budget pending a detailed business plan with rapid ROI and positive cash flow projections. The company already markets multiple products to its customer base, often creating greater customer value by synergistic benefits provided by multiple products. Addition of an enterprise MDM offering will further enhance the cumulative customer value the company can create.

Licensing alliances and partnerships are very popular means of enabling diffusion of innovations, and are often used as stepping-stones toward an acquisition. A rapidly changing industry landscape, a maturing alliance relationship and natural company evolution might change the balance of synergies between the companies from modular and relatively misaligned to becoming reciprocal and symmetrical. Resource utilization patterns, market uncertainty and competition levels can also change, presenting an opportunity to reevaluate the established relationship, which, depending on the new combination of factors, can either lead to abandonment of the relationship or to its escalation into an acquisition. Once a licensing partnership is formed, it is necessary to review and reevaluate it on an ongoing and regular basis.

Although the partnership alternative has been proven to be the most optimal alternative for the company to enter the enterprise MDM market at the moment, this option is prone to a number of potential downsides that must be taken into consideration. Implementation of packaged third-party technology limits the company's competitive advantage to the benefits the original technology provider has chosen to make available, which is why it is important to partner with a dynamic technology provider that continues to innovate and regularly add more functionality to the SDK. Another potential problem of holdup in the partnership might arise due to a change in bargaining power of the SDK provider after the company acquires the SDK and publicly announces the product launch, resulting in a significant transaction-related investment on behalf of the company.

The licensing partnership option builds on a comprehensive set of weighted evaluation criteria for the creation of a shortlist of SDK and API providers for integration. Such factors as company viability, quality of the MDM technology and the SDK or API offering, availability of features through the SDK, level of observed customer satisfaction, and experience and reputation of executive management have been assessed for all potential implementation partners to arrive at the recommendation to conduct a technical evaluation of technologies provided by AirWatch, Good Technology and MobileIron.

The recommended forthcoming detailed technical evaluation will determine the single superior technology partner, leading to creation of a thorough business plan for launching an enterprise MDM product offering. The business plan will be based on negotiated terms with the technology provider and detail the unique final product value proposition, marketing, operations and launch plan, along with cash flow projections, risk assessment and ROI estimates. It will provide the necessary information and guidelines to bridge the above-identified gaps in managerial preferences and organizational capabilities for a successful product launch.

Appendices

Appendix A   MDM Provider Overview

Table 22 – Overview of Organizational Data for MDM Providers.

Company	Year Founded	Ownership	# of employees	Revenue in $US M Last Fiscal Year	Pure-Play MDM	HQ Location	Website
Absolute Software	1993	TSE:ABT	342	69	NO	Vancouver, BC, Canada	www.absolute.com
AirWatch	2003	Privately held	265*	53†	YES	Atlanta, GA, USA	www.airwatch.com
Apple	1976	NASDAQ:AAPL	60,400	108,249	NO	Cupertino, CA, USA	www.apple.com
BoxTone	1999	Privately held	81*	16.2†	YES	Columbia, MD, USA	www.boxtone.com
Capricode	2002	Privately held	20*	4†	YES	Oulu, Finland	www.capricode.com
Excitor	2001	Privately held	46*	9.2†	YES	Copenhagen, Denmark	www.excitor.dk
FancyFon Software	2006	Privately held	15*	3†	YES	Cork, Ireland	www.fancyfon.com
Fiberlink	1991	Privately held	236*	47.2†	YES	Blue Bell, PA, USA	www.maas360.com
Fixmo	2004	Privately held	52*	10.4†	YES	Toronto, ON, Canada	www.fixmo.com

Company	Year Founded	Ownership	# of employees	Revenue in $US M Last Fiscal Year	Pure-Play MDM	HQ Location	Website
Good Technology	1999	Privately held	727*	145.4†	YES	Sunnyvale, CA, USA	www.good.com
Google	1998	NASDAQ:GOOG	32,467	37,905	NO	Mountain View, CA, USA	www.google.com
IBELEM	2001	Privately held	19*	3.8†	YES	Nanterre, France	www.ibelem.com
McAfee (Intel)	1989	NASDAQ:INTC	100,100‡	53,999	NO	Santa Clara, CA, USA	www.mcafee.com
Microsoft	1975	NASDAQ:MSFT	90,000	69,943	NO	Redmond, WA, USA	www.microsoft.com
MobileIron	2007	Privately held	232*	46.4†	YES	Mountain View, CA, USA	www.mobileiron.com
Numara Software (BMC)	1991	NASDAQ:BMC	6,200§	2,065	NO	Tampa, FL, USA	www.numarasoftware.com
Odyssey Software (Symantec)	1996	Privately held	33*	6.6†	YES	West Henrietta, NY, USA	www.odysseysoftware.com
Research in Motion	1984	NASDAQ:RIMM	17,500	19,907	NO	Waterloo, ON, Canada	www.rim.com
Smith Micro	1982	NASDAQ:SMSI	550	57.77	NO	Aliso Viejo, CA, USA	www.smithmicro.com
SOTI	1995	Privately held	94*	18.8†	YES	Mississauga, ON, Canada	www.soti.net

Company	Year Founded	Ownership	# of employees	Revenue in $US M Last Fiscal Year	Pure-Play MDM	HQ Location	Website
Sybase (SAP)	1984	FRA:SAP	54,589	5,920	NO	Dublin, CA, USA	www.sybase.com
Symantec	1982	NASDAQ:SYMC	18,600	6,190	NO	Mountain View, CA, USA	www.symantec.com
Tangoe	2000	NASDAQ:TNGO	873	104.94	NO	Orange, CT, USA	www.tangoe.com
The Institution	2006	Privately held	42[*]	8.4[†]	YES	Stockholm, Sweden	www.theinstitution.se
Ubitexx (RIM)	2002	Privately held	13[*]	2.6[†]	YES	Munich, Germany	www.ubitexx.com
Zenprise	2003	Privately held	115[*]	23[†]	YES	Redwood City, CA, USA	www.zenprise.com

[*] Number of employees for a privately held company is retrieved from company's LinkedIn.com profile page.

[†] Revenues for privately held companies are assumed to be $200,000 per employee.

[‡] Intel's number of employees and revenues are specified for McAfee.

[§] BMC's number of employees and revenues are specified for Numara Software.

Appendix B   Currently Available MDM Functionality by Vendor

Table 23 - Overview of MDM Functions Offered by Current MDM Vendors.

Company	OS Support	Real-time Inventory	Self Service Portal	Over The Air (OTA)	Application Management	Selective Wipe	Content & URL filtering	API/SDK Availability
Absolute Software	Android, iOS	✔	✔	✔	✔	✔		
AirWatch	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔	✔	✔
Apple	iOS			✔				
BoxTone	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔	✔	
Capricode	Android, iOS, Windows, Symbian	✔	✔	✔	✔	✔		✔
Excitor	Android, iOS, BlackBerry, Windows, Symbian	✔		✔	✔	✔		
FancyFon Software	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔		✔
Fiberlink	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔		✔
Fixmo	Android, iOS, BlackBerry	✔	✔	✔	✔	✔		✔
Good Technology	Android, iOS, Windows, Symbian	✔	✔	✔	✔	✔	✔	✔
Google	Android		✔	✔		✔		
IBELEM	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔		
McAfee	Android, iOS, BlackBerry, Windows	✔	✔	✔		✔	✔	
Microsoft	Windows			✔	✔	✔		
MobileIron	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔	✔	✔
Numara Software	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔		
Odyssey Software	Android, iOS, BlackBerry, Windows	✔	✔	✔	✔	✔		✔
Research in Motion	BlackBerry	✔	✔	✔	✔	✔		
Smith Micro	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔		
SOTI	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔		
Sybase (SAP)	Android, iOS, Windows, Symbian	✔		✔	✔	✔		
Symantec	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔		
Tangoe	Android, iOS, BlackBerry, Windows	✔	✔	✔		✔		✔
The Institution	Android, iOS, Windows, Symbian	✔	✔	✔	✔	✔		
Ubitexx (RIM)	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔		
Zenprise	Android, iOS, BlackBerry, Windows, Symbian	✔	✔	✔	✔	✔	✔	

Legend	
Present	✔
Missing	
Android	(Android icon)
BlackBerry	(BlackBerry icon)
iOS	(iOS icon)
Symbian	(Symbian icon)
Windows	(Windows icon)

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