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Business Value Highlights

391%

Average five-year ROI

9

months to breakeven

\$42,648

in business benefits per
100 users per year

19%

higher patient satisfaction

28% more productive care
coordinator teams

27%

more efficient EHR/EMR
administration

Microsoft Dynamics CRM: Demonstrating Improvements in Quality and Efficiency of Patient Care

EXECUTIVE SUMMARY

The intense focus on electronic health record (EHR) deployment by healthcare organizations across the globe presents a set of challenges for provider organizations looking to leverage their EHR investment and create a competitive advantage by providing quality care and improving clinician productivity by having better access to healthcare information. In the United States, the EHR vendors' focus on meeting the latest meaningful use requirements inhibits EHR product innovation. Worldwide, many EHRs have not been migrated to more modern, nimble platforms, which makes them difficult to integrate with or extend by developing additional capabilities that could, among other things, enhance clinical workflow and improve care team collaboration.

IDC interviewed six healthcare organizations to understand the impact of their use of Microsoft Dynamics CRM solutions in conjunction with their electronic health record/electronic medical record (EMR) systems on the quality and efficiency of their patient care. These healthcare organizations reported that Microsoft Dynamics CRM is allowing them to better leverage patient data to communicate more effectively with patients, increase the efficiency of caregivers, and provide better quality of care. Based on these interviews, IDC calculates that these organizations will realize from their use of Microsoft Dynamics CRM average annual benefits worth \$42,648 per 100 users per year over five years, which would result in an average five-year return on investment (ROI) of 391% by:

- **Improving the quality of care** by providing patients with more personalized and more efficient care
- **Making caregivers more productive** by leveraging patient data to plan and carry out more effective and efficient treatment plans and to better communicate with patients

- **Delivering staff efficiencies** in administering and supporting health records and CRM systems by linking systems together, providing easier and more consistent access to data
- **Reducing operational and business risk** by improving the organizations' ability to meet healthcare regulations and reducing health records system-related downtime.

SITUATION OVERVIEW

Healthcare organizations face extreme business, clinical, and technical pressure as they make the shift from fee-for-service- to value-based care delivery and reimbursement models. To succeed in this new paradigm, healthcare organizations must be increasingly more agile and collaborative. Legacy EHRs, as they are architected today, lack true collaboration capabilities, which result in clinician inefficiencies and dissatisfaction. With the shift from volume- to value-based payments, patients are now discharged “quicker and sicker” into a delivery ecosystem that was never designed to expertly manage and coordinate care beyond any single facility. And, while incremental gains in EHR interoperability are making it easier for external stakeholders to share and access EHR data, the industry has shown little progress in the way of making electronic communications and collaboration sufficiently easier, secure, and seamless to bridge the critical points of communication and coordination failures — in part because healthcare organizations do not invest in CRM solutions as much as other industries do

The Need for CRM Capabilities in Healthcare

Virtually every other industry invests in customer segmentation, buying preferences, price sensitivity, and a range of other customer attributes. While CRM plays an important role as a sales and marketing tool for many industries, it can be used very effectively to manage cases, whether they involve sales opportunities, customer support issues, or patient care. Healthcare organizations are beginning to recognize the importance of CRM as a component of their patient engagement strategy. According to IDC Health Insights' 2015–2016 Healthcare Provider Technology Spend Survey, October 2015, 31.6% of organizations reported that investing in CRM technology was among the top 3 priorities when asked why their overall IT spending increased over the 2015–2016 period. CRM can help healthcare organizations:

- **Achieve a 360-degree view of the patient.** The new care models and population health require a complete view of the patient. It has been well documented in the literature that clinical care (access and quality) contributes only 20% to overall health. Social determinants such as healthy behaviors (30%), social and economic factors (40%), and physician environment (10%) make up the remainder. Better access to information about the patient's diet and exercise routines and whether the patient routinely abuses drugs or alcohol and has access to transportation to medical appointments and family support will

help caregivers develop patient-centered care plans that will take into consideration other factors that could encourage or hinder compliance.

- **Provide patient-centered case/care management.** CRM lends itself very well to case and care management activities, with its ability to segment consumers, develop and execute outreach campaigns, track patient response, and analyze both quantifiable and quantitative results. Care is coordinated through patient-centered workflows using standard protocols across the enterprise. An increasing focus on population health management will require the ability to manage the care of patients with not just one but multiple chronic conditions. Coordinating where care is received through referral management will prevent leakage, an important consideration for healthcare organizations that have accepted risk-based contracts.
- **Enhance care team collaboration.** Improved communication among team members and between care teams at hand-off points can help mitigate adverse medical events, achieve workflow and process improvements, improve staff utilization and productivity, and reduce patient length of stay and costs through efficiency gains. CRM tools embedded within the EHR facilitate the flow of information between clinicians. The ability to communicate with not only colleagues within the enterprise but also other parties outside the enterprise is especially critical for complex care coordination, which requires multidisciplinary teams that cross organizational boundaries.
- **Improve the omni-channel experience.** CRM tools can help synchronize data from EHRs and other clinical systems to create a common view of the patient health record that is accessible to clinicians and patients across multiple channels (with the appropriate privacy and security provisions in place). Consumers have access to the same health information across Web, mobile, or telephonic access channels. Similarly, hospital staff having access to the same information are better able to respond to patient inquiries about appointments, billing issues, and availability of test results, to name a few.

Microsoft Dynamics CRM for Healthcare

Microsoft Dynamics CRM provides functions typical of most commercial CRM packages, including sales force automation, marketing planning and automation, social listening and engagement, customer service, and analytics, that can be tailored to meet the unique CRM needs of healthcare organizations described previously. It also leverages Outlook 365, a combination of productivity and unified communication and collaboration applications, which works across any platform and device and includes the following applications:

- **Exchange Online** enables users to share calendars and schedule meetings, regardless of the environment their mailboxes are in (e.g., on-premise, hybrid, or cloud) and the device they are using or the platform on which it runs (e.g., PC, Mac, Android, iOS, and Windows). It includes enterprise features, such as encryption information rights management and data loss prevention. In-Place Hold (formerly Legal Hold) and In-Place eDiscovery offer additional control over sensitive communications and ensure compliance with privacy and security policies.
- **Skype for Business (formerly Lync Online)** provides high-definition multiparty videoconferencing in addition to instant messaging and voice over IP (VoIP) services and collaboration support. Collaboration is available through whiteboard documents where participants can share drawings and text and make graphical annotations and PowerPoint documents where participants can similarly edit and collaborate together on presentations. Presenters can use polling lists to organize polls, and participants can respond to the polls and see the results. Desktop and Windows application sharing enables colleagues to see and collaborate on a desktop screen or Windows application. Skype mobile clients are available on major smartphone platforms like iOS, Android, and Windows Phone, with the ability to support desktop or screen sharing on the mobile/ smartphone client.
- **OneNote** is a pen-enabled digital notebook for capturing unstructured “notes to self,” to-dos, meeting notes, and anything else professionals need to remember. Notes are automatically saved and synced in the cloud and can be accessed from any location in real time from any device or Web browser using OneNote, OneNote Mobile, or OneNote Web App through OneDrive for Business (formerly SkyDrive).
- **SharePoint Online** stores documents and team communications, including email about a given project or function, in one place, which is referred to as SharePoint Team Sites. Through social networking in SharePoint, healthcare professionals can follow people, care teams, documents, and sites. Activity feeds keep team members apprised of what is going on. Site mailboxes are accessible between SharePoint and Outlook.
- **OneDrive for Business** enables professionals within and across organizational boundaries to coauthor, review, and share documents in real time or asynchronously across devices. Users can work on shared documents such as clinical guidelines, checklists, reports, presentations, clinical and Lean Six Sigma process improvement initiatives, or care plans in real time or in offline mode on their devices and then sync up again when reconnected to the OneDrive. As part of the Office 365 service, OneDrive for Business is an enterprise-grade product and offers regulatory compliance features that are covered by the BAA with Microsoft. In contrast, SkyDrive is the consumer version.

- **Mobile applications**, such as iOS and Android apps for Skype, OneNote, and OneDrive for Business, are native and give users seamless productivity from almost any device of their choice.

THE BUSINESS VALUE OF MICROSOFT DYNAMICS CRM SOLUTIONS FOR EHR/EMR

Study Demographics

IDC interviewed six healthcare organizations in the first half of 2016 that are using Microsoft Dynamics CRM solutions in conjunction with their EHR/EMRs. Interviews were designed to capture a range of qualitative and quantitative information about how Dynamics CRM has impacted their ability to provide care, meet patient expectations, and support their medical records systems, among other topics. On average, interviewed organizations had 6,676 employees, with all but one having more than 1,000 employees. Interviews reflected the experiences of two full-scale medical centers that provide a variety of types of medical care to the general public, and four organizations that provide care and other types of services to specific groups of individuals, including the elderly and disadvantaged youth. Five organizations were based in the United States, and one was based in Singapore (see Table 1).

TABLE 1 Demographics of Interviewed Healthcare Organizations Using Microsoft Dynamics CRM

	Average	Median
Number of employees	6,676	2,850
Number of IT staff	74	22
Number of IT users	6,632	2,725
Number of business applications	35	16

n = 6 Source: IDC, 2016

Table 2 provides an overview of the scale of operations of the interviewed healthcare organizations. Two of the interviewed medical centers had more doctors and nurses than the other interviewed organizations, while four of the other interviewed organizations counted more caregivers who were not doctors or nurses. Both types of organizations rely on care

coordinators to serve their patients efficiently and effectively, as reflected by the average care coordinator team size of 87. Meanwhile, an average of more than 500 beds at these organizations reflects the scale of the care they provide and are supporting with their EHR/EMRs and Microsoft Dynamics CRM solutions.

TABLE 2 Healthcare Profiles of Interviewed Healthcare Organizations Using Microsoft Dynamics CRM

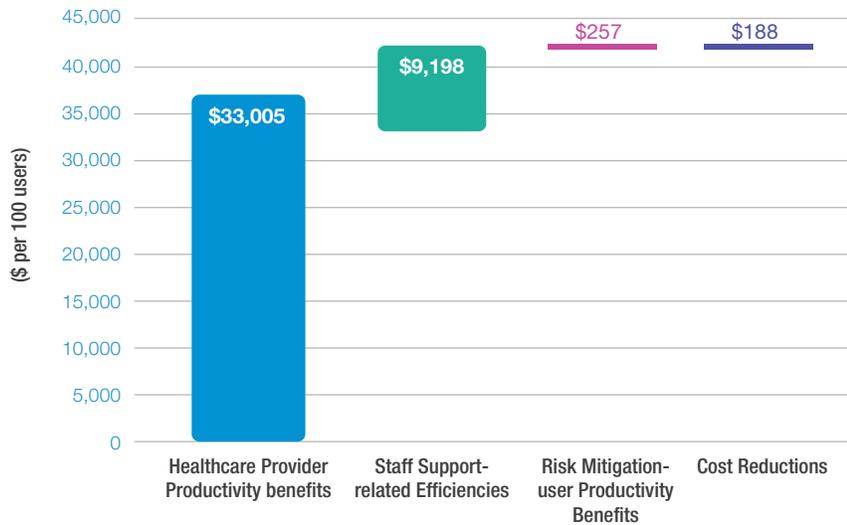
	Average	Median
Number of hospitals	4	0
Number of physicians	405	13
Number of nurses	880	50
Number of other caregivers	1,399	700
Number of care coordinators	87	23
Number of beds	513	575
Number of acute facilities	4	1
Number of ambulatory facilities	51	1

n = 6 Source: IDC, 2016

Business Value Analysis

Interviewed organizations reported to IDC that supporting their health records systems with Microsoft Dynamics CRM has enabled them to provide more effective and efficient care to their patients. They explained that they can now make better use of patient data in communicating with, and planning and executing care for, patients. As a result, their caregivers provide better care, while Dynamics CRM also enables more efficient operation of medical records systems on the back end. As a result, IDC projects that these organizations will capture value worth an average of \$42,648 per 100 users (\$2.83 million per organization) per year over five years in the following areas (see Figure 1):

FIGURE 1 Average Annual Benefits per 100 Users



Source: IDC, 2016

Average Annual Benefits: \$42,648 per 100 users

- Caregiver productivity benefits.** Caregivers and care coordinators are more efficient because they have better access to patient data and can make better use of it throughout the caregiving process. As a result, they spend more time caring for patients instead of handling administrative and data-related matters and, ultimately, care for and support more patients. IDC calculates that interviewed organizations will achieve higher caregiver and care coordinator productivity worth an average of \$33,005 per 100 users (\$2.19 million per organization) per year over five years.
- Records and CRM support efficiencies.** Staff time is saved in administering and managing EHR/EMR systems through automation, integration, and more robust availability of patient data. IDC projects that interviewed organizations will realize efficiencies for staff supporting medical records and CRM systems worth an average of \$9,198 per 100 users (\$610,000 per organization) per year over five years.
- Risk mitigation – user productivity benefits.** Organizations minimize their exposure to potential regulatory-related penalties and reduce the frequency of records system and CRM outages. IDC puts the value of higher user productivity as a result of reducing downtime at an average of \$257 per 100 users (\$17,100 per organization) per year over five years.
- IT infrastructure cost reductions.** Organizations benefit from a more robust CRM solution than their legacy CRM solutions while eliminating costs associated with those solutions. IDC calculates that by retiring other CRM solutions, interviewed organizations will save an average of \$188 per 100 users (\$12,500 per organization) per year over five years.

Enhancing Quality of Care and Caregiver Productivity with Microsoft Dynamics CRM

Interviewed healthcare organizations expressed common themes in describing why they chose to use Microsoft Dynamics CRM solutions in support of their EHR/EMR systems: They needed to provide more timely and efficient care and understood that better leveraging patient data was a means of achieving these objectives. As one interviewed organization explained: “We needed a system that could manage many services, admit patients, track provided services, and process those claims. Microsoft Dynamics CRM is helping us achieve these operational goals.” By integrating their medical records systems with CRM capabilities with Microsoft Dynamics, healthcare organizations are making better use of data to make their care providers and care coordinators more productive and ultimately provide a better patient experience.

Enabling Caregivers to Better Serve Patients

Interviewed healthcare organizations cited efficiencies for caregivers — including physicians, nurses, and other caregivers — as a core benefit of using Microsoft Dynamics CRM. They must balance the need to provide the highest possible quality of care and ensure patient satisfaction while maintaining efficient and cost-effective operations. To accomplish this, they need their caregivers and care coordinators — who are also their primary patient-facing conduits — to maximize the utility of patient data and other information in their medical records systems. Microsoft Dynamics CRM is helping ensure that these caregivers have the right patient data to provide customized and efficient care and better communicate with patients.

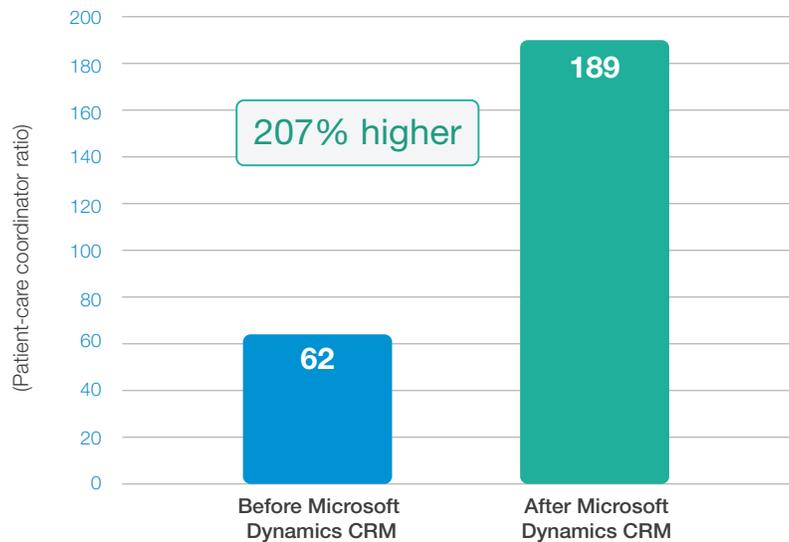
Interviewed organizations reported that their caregivers are more productive with Microsoft Dynamics CRM. These care providers benefit from having accurate and updated patient information, needing to spend less time on data entry, and being able to better maintain ongoing communications with patients. All of these benefits save time for these caregivers and allow them to make the best use of the time they have with their patients. As one organization explained: “With Microsoft Dynamics CRM, information about patients is now more available to caregivers, which saves time and improves diagnosis and case management.” Table 3 provides an overview of the average efficiencies for caregivers who these organizations say have benefited from Microsoft Dynamics CRM, as well as the net benefit in terms of higher productivity.

TABLE 3 Caregiver Impact and Efficiencies: Microsoft Dynamics CRM

	Number	Average Efficiency for Impacted Caregivers (%)	Time Saved per 100 Caregivers of Each Group (Hours)
Physicians	405	23	96
Nurses	880	37	717
Other Caregivers	1,399	30	388

Source: IDC, 2016

Another group of employees that has benefited significantly from Microsoft Dynamics CRM is care coordinators. These individuals, who work with patients to plan and carry out their care plans, depend on the timeliness, accuracy, and robustness of patient data. Dynamics CRM is supporting them by reducing the amount of time they must spend providing information to primary caregivers and providing seamless and timely access to centralized data and automated workflows and by reducing medical records systems-related errors and problems. As a result, interviewed organizations have been able to substantially increase their patient-care coordinator ratio, enabling them to support many more patients without growing their care coordinator teams (see Figure 2). IDC calculates an average productivity increase of 28% for these organizations' care coordination teams — which average 87 members each — through efficiencies such as those explained by one organization: “Microsoft Dynamics CRM helps us process patient information more completely and get patients the type of care they want. It transforms how and when we give care and offers the customer control over that care.”

FIGURE 2 Care Coordinator Impact: Microsoft Dynamics CRM

Source: IDC, 2016

Higher Quality of Care

The caregiver and care coordinator efficiencies described previously, when combined with improved flow of patient information and communications, are ultimately helping interviewed healthcare organizations provide better care. This means that Microsoft Dynamics CRM is helping interviewed organizations achieve their core missions — providing a high standard of care to patients — while ensuring that their patients are satisfied with the care they receive. As one interviewed organization reported: “With Microsoft Dynamics CRM, patients move through various services that we provide more readily. In the past, the process could be slower in any one of those areas. So not only are there improvements in each area, but our cumulative performance and service have improved.” As a result, interviewed healthcare organizations attributed an average increase in patient satisfaction of 19% to their use of Microsoft Dynamics CRM (going from 62% to 73% satisfied patients).

Business Operational Efficiencies and Improvements

Given the profiles of the interviewed organizations and how they are using Microsoft Dynamics CRM, the benefits they are achieving are clustered around staff efficiencies and improving the quality of care rather than more business-focused metrics such as billing efficiencies and patient retention. However, several organizations reported that they are leveraging Dynamics CRM to improve operational results. For example, one organization explained that Dynamics CRM has positively impacted its ability to manage billing: “We are better at managing our

revenue cycle from the point of entry and being able to track the payments from patients' providers. The services get interfaced with the billing system. A lot of information for payer updates, insurance plan updates, and the services themselves get tied to a revenue amount with Microsoft Dynamics CRM." As a result, this organization reported collecting on more than 10% bills.

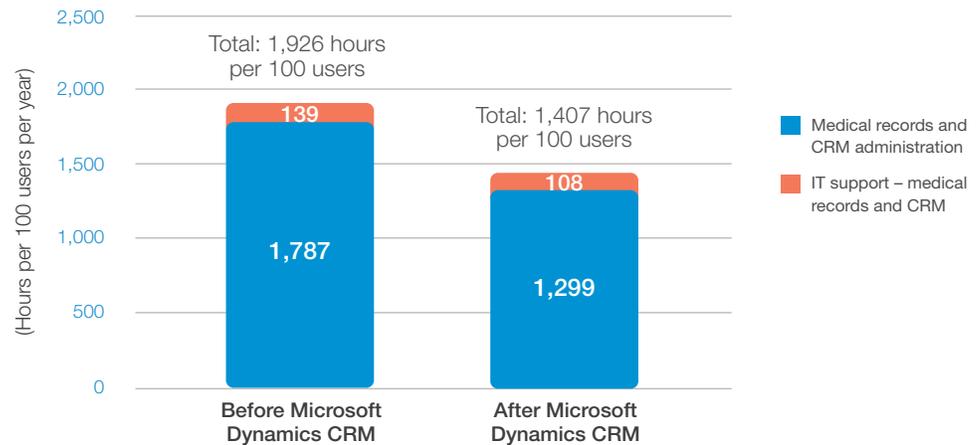
Efficiencies in Supporting Medical Records and CRM Systems

Microsoft Dynamics CRM also enables efficiencies for staff who support medical records and CRM operations. These systems are data intensive, which necessitates spending substantial amounts of time on finding, manipulating, and entering data. Microsoft Dynamics CRM offers these organizations benefits such as automation and dashboards that they are able to translate to time savings for individuals supporting their EHR/EMR operations and to disseminate information to caregivers more easily. As one interviewed organization noted: "We spend much less time chasing down data across departments, and we are able to do analytics on how the operations are running."

Meanwhile, IT staff teams must invest less time in supporting medical records and CRM systems because of real-time dashboards, centralization of data, and features such as incident reporting systems. This is an important benefit, especially for healthcare organizations that typically maintain lean IT staffing models. As one interviewed organization commented: "Microsoft Dynamics CRM has afforded our IT staff the ability to better support our operations, care coordination, and administrative staff. With our CRM integration, our support group plays a more active role, at least at the lower levels. It has improved our ability to support our internal customers."

Figure 3 shows that these efficiencies mean that fewer staff hours are required on an ongoing basis to support EHR/EMR and CRM operations — on average, 27% less time for administrative work related to supporting these systems, and 23% less IT staff time to support these systems.

FIGURE 3 Administrative and IT Staff Efficiencies:
Microsoft Dynamics CRM



Source: IDC, 2016

Minimizing Regulatory Risk and the Cost of Outages of Medical Records and CRM Systems

Every interviewed healthcare organization credited improved flow of information and data achieved with Microsoft Dynamics CRM as helping them ensure regulatory compliance. This provides interviewed organizations greater confidence in their compliance and knowledge that they have the capabilities needed to avoid the potential of costly fines or reputation-harming incidents. As one organization that is leveraging Microsoft Dynamics CRM to make its training efforts more robust explained: “Through Microsoft Dynamics CRM’s support of meaningful use, we have been able to help many physicians meet regulatory goals. This can help avoid penalties. The potential savings are in the range of millions of dollars. Having the information readily available through CRM allows us to pull it out whenever we need it.”

In addition to minimizing regulatory risk, interviewed organizations are benefiting from the more robust Microsoft Dynamics CRM platform than the CRM solutions they replaced. As a result, they are experiencing fewer unplanned outages affecting medical records and CRM systems. In addition, because there are fewer problems, users experience fewer problems, meaning that interviewed organizations’ help desks must spend less time responding to such issues.

TABLE 4 Risk Mitigation, Unplanned Downtime, and Help Desk: Microsoft Dynamics CRM

	Before Microsoft Dynamics CRM	With Microsoft Dynamics CRM	Difference	Change (%)
Unplanned downtime				
Number of instances per year	4	4	0	10
MTTR (hours)	4.3	1.7	2.7	62
Productive time lost per 100 users per year (hours)	18	12	6	35
Help desk				
Number of tickets per year	12,455	10,563	1,892	15
MTTR (hours)	0.3	0.2	0.1	47
Productive time lost per 100 users per year (hours)	40	22	18	45

Source: IDC, 2016

ROI Analysis

IDC interviewed six organizations that are using Microsoft Dynamics CRM solutions in conjunction with their EHR or EMR systems to provide more effective and efficient patient care. IDC recorded the results of these interviews to inform this study's analysis of the benefits and costs these organizations attributed to Microsoft Dynamics CRM. IDC used the following three-step method for conducting the return-on-investment analysis:

- 1. Gathered quantitative benefit information during the interviews using a before-and-after assessment.** In this study, the benefits included caregiver, administrative, and other staff productivity gains; higher revenue from better collecting bills; and CRM solution cost reductions.
- 2. Created a complete investment (five-year total cost analysis) profile based on the interviews.** Investments go beyond the initial and annual costs of using Microsoft Dynamics CRM and can include additional costs, such as migrations to Microsoft Dynamics CRM, planning, consulting, and staff or user training.

3. Calculated the ROI and payback period. IDC conducted a depreciated cash flow analysis of the benefits and investments for these public sector organizations' use of Microsoft Dynamics CRM over a five-year period. ROI is the ratio of the net present value (NPV) and the discounted investment. The payback period is the point at which cumulative benefits equal the initial investment.

Table 5 presents IDC's analysis of the average discounted benefits, discounted investment, and return on investment for interviewed healthcare organizations' investment in, and use of, Microsoft Dynamics CRM in conjunction with their EHRs and EMRs. IDC projects that these healthcare organizations will invest an average discounted total of \$30,869 per 100 users (\$2.05 million per organization) over five years in Microsoft Dynamics CRM in licenses, staff time to deploy and maintain, and other associated costs including third-party implementation costs. IDC expects that in return, these organizations will earn average discounted business benefits worth \$151,521 per 100 users (\$10.05 million per organization) over five years based on the caregiver and administrative efficiencies and productivity gains, as well as other benefits discussed in this study. This would result in an average five-year ROI of 391%, with breakeven occurring in an average of nine months.

TABLE 5 Five-Year ROI Analysis

	Per Organization	Per 100 Users
Benefit (discounted)	\$10.05 million	\$151,521
Investment (discounted)	\$2.05 million	\$30,869
Net present value (NPV)	\$8.00 million	\$120,652
Return on investment (ROI)	391%	391%
Payback period	9 months	9 months
Discount rate	12%	12%

Source: IDC, 2016

CHALLENGES/OPPORTUNITIES

Complexities of IT, Consolidation, and Compliance

Healthcare IT by its very nature is complex. The IT portfolio is a heterogeneous combination of administrative, clinical, and operational applications running on different platforms and technologies as a result of best-of-breed technology-buying decisions and mergers and acquisitions (M&As) of other healthcare organizations. Even after rationalizing multiple EHRs to a single (or relatively few) “best of breed” vendor solutions, the next M&A event adds to the complexity of the enterprise’s IT portfolio. In some instances, it makes sense to reuse what the healthcare organization already has in place to leverage existing investments, and in other cases, rationalizing applications again is warranted.

Fragmented Care and Communication Channels

One of the largest communication challenges facing healthcare organizations — and consumers — is how modern healthcare is organized. Only a few decades ago, primary care physicians, in addition to treating their patients in their offices, would see patients in many different care settings such as in the ED hospital or rehabilitation facility. Today, approximately 90% of office-based physicians do not make hospital calls. Clinicians have become very siloed by their area of specialization. Consequently, hospital- and community-based physicians typically do not know each other very well because of limited opportunities to work closely together, which adversely impacts patient follow-up care.

Fragmented communication persists even within the four walls of the institution. Fragmented information handoffs between shift changes can result in suboptimal workflows, performance of redundant tests and, more importantly, patient safety issues. In fact, the Joint Commission’s Sentinel Event Database reveals that poor communication is the root cause in nearly 70% of reported sentinel events, which it defines as an unexpected event involving death or serious physical or psychological injury, or risk thereof, not related to the natural course of the patient’s illness.

SUMMARY AND CONCLUSION

Historically, CRM was viewed as a tool used by sales and marketing organizations to manage sales opportunities. This perception has limited the adoption of CRM by healthcare organizations. Today’s CRMs have expanded capabilities that enable true case management at the individual customer/consumer/patient level. Thus healthcare organizations are

deploying CRM solutions to support consumer engagement initiatives, provide case management for patients with acute conditions, and manage patients with chronic conditions.

IDC's interviews with healthcare organizations demonstrate the substantial value that they are achieving by using Microsoft Dynamics CRM solutions to support their case management and patient engagement efforts. These organizations reported achieving strong operational efficiencies by leveraging patient data to communicate more effectively with patients, increase the efficiency of caregivers, and provide better quality of care, in addition to reducing the burden of administering and supporting their health records and CRM systems. For interviewed organizations, these efficiencies with Microsoft Dynamics CRM are contributing to improved patient care experiences and more satisfied patients, which is ultimately what these healthcare organizations are striving to achieve.

Appendix

IDC's standard ROI methodology was utilized for this project. This methodology is based on gathering data from current users of Microsoft Dynamics CRM as the foundation for the model. Based on these interviews, IDC performs a three-step process to calculate the ROI and payback period:

- Measure the savings and benefits from caregiver, administrative, and other staff productivity gains; higher revenue from better collecting bills; and CRM solution cost reductions over the term of the deployment.
- Ascertain the investment made in deploying the Microsoft Dynamics CRM solution and the associated migration, training, and support costs.
- Project the costs and savings over a five-year period and calculate the ROI and payback for the deployed solution.

IDC bases the payback period and ROI calculations on a number of assumptions, which are summarized as follows:

- Time values are multiplied by burdened salary (salary + 28% for benefits and overhead) to quantify efficiency and manager productivity savings.
- Downtime values are a product of the number of hours of downtime multiplied by the number of users affected.
- The impact of unplanned downtime is quantified in terms of impaired end-user productivity and lost revenue.

- Lost productivity is a product of downtime multiplied by burdened salary.
- The net present value of the five-year savings is calculated by subtracting the amount that would have been realized by investing the original sum in an instrument yielding a 12% return to allow for the missed opportunity cost. This accounts for both the assumed cost of money and the assumed rate of return.

Because every hour of downtime does not equate to a lost hour of productivity or revenue generation, IDC attributes only a fraction of the result to savings. As part of our assessment, we asked each company what fraction of downtime hours to use in calculating productivity savings and the reduction in lost revenue. IDC then taxes the revenue at that rate.

Further, because IT solutions require a deployment period, the full benefits of the solution are not available during deployment. To capture this reality, IDC prorates the benefits on a monthly basis and then subtracts the deployment time from the first-year savings.

Note: All numbers in this document may not be exact due to rounding.

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