"An Analysis of Physician Practice Management Systems"

A dissertation submitted in partial fulfillment of the requirements for the award of

Post Graduate Diploma in Health and Hospital Management

By

Harshita Vijh

PG/11/030

International Institute of Health Management Research

New Delhi - 110075

Month, Year

April, 2013

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Under the Guidance of

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April, 2013

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To Whomsoever It May Concern

This is to certify that **Ms. Harshita Vijh**, of **International Institute of Health Management Research, New Delhi (IIHMR –New Delhi)** campus has been working with **Dell International Services, Bangalore** for her dissertation project.

Project Details:

Project Name: "An Analysis on Physician Practice Management Systems"
Duration: 12 Weeks
Location: Bangalore
Guide Name: Ms. Archika Roy
Sponsor Name: Vivek Vig

She has successfully completed her project and her performance during the tenure of the internship has been found to be satisfactory.

Her findings in course of the project has been found to be practical and relevant and some the recommendations will be incorporated on the floor on approval from the business.

We wish her good luck for her future assignments.

Thanking You,

Regards,

Adarsh Naik

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CERTIFICATE OF DISSERTATION COMPLETION

April 14, 2013

TO WHOM IT MAY CONCERN

This is to certify that **Ms. Harshita Vijh** has successfully completed her three months internship in our organization from **January 14, 2013 to April 14, 2013**. During this tenure, the intern has worked on **"An Analysis on Physician Practice Management Systems"** under the guidance of me and my team at **Dell International Services, Bangalore**.

We wish her good luck for her future assignments.

Regards,

Adarsh Naik

Adarsh Naik
Talent Acquisition Manager II

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CERTIFICATE OF APPROVAL

The following dissertation titled **"An Analysis on Physician Practice Management Systems"** is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **Post- Graduate Diploma in Health and Hospital Management with Specialization in Healthcare IT** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation

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CERTIFICATE FROM DISSERTATION ADVISORY COMMITTEE

This is to certify that **Ms. Harshita Vijh**, a graduate student of the **Post- Graduate Diploma in Health and Hospital Management**, has worked under our guidance and supervision. She is submitting this dissertation titled **"An Analysis on Physician Practice Management Systems"** in partial fulfillment of the requirements for the award of the **Post- Graduate Diploma in Health and Hospital Management**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

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Apart from the personal effort and steadfastness to work, constant inspiration and encouragement given by a number of individuals served as the driving force that enabled me to submit my summer training report in the present form.

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"Physician Practice Management – A Business Case for Dell Services" and also, for his constant encouragement, inspiration and intelligence criticism to improvise on the study. His ample cooperation and regular support and valuable suggestions regarding the project report were very helpful at every stage.

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Harshita Vijh

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ABSTRACT

"An Analysis of Physician Practice Management Systems"

Harshita Vijh

The gradual increase in the adoption and achievement of the meaningful use for EHR and Practice management solutions amongst the American physician community, has paradoxically lead to the increased demand for Ambulatory EHR or the Physician Practice Management Systems (PPMS/PMS) since 2009. This steady increase in demand is attributed due to the authorized stimulus monies/incentives to be received through the Medicare and Medicaid programs from the American Reinvestment and Recovery Act/ Health Information Technology for Economic and Clinical Health Act (ARRA-HITECH Act). Furthermore, the rising claim submission pressure by both Federal Government and regulatory bodies, is also acting as the major driver for the U.S. PPM market and is an encouraging factor for the American physicians' to adapt the electronic claim submission by purchasing an effective practice management solution to enhance their medical practice.

Scope

The report describes the extent to which the American physicians are using the practice management systems to improvise their medical practice to sustain in the U.S. healthcare market through 2011. The study majorly focuses on understanding the practice management solution, its adoption by the physician community, the U.S. PPM market trends and the future of PPM for the U.S. healthcare market.

Objective

The main objective of the study is to do an Analysis of the Physician Practice Management Systems.

Methodology

This is purely a descriptive and an exploratory qualitative study conducted based on the secondary data. The various secondary sources used for the study are the American Medical

Association (AMA), The Physicians Foundation, Capsite Database, Pubmed, Centers for Medicare & Medicaid Services (CMS), U.S. Department of Health and Human Services, National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC), Center for Studying Health System Change, Journal of Healthcare Information Management, American Academy of Family Physicians (AAFP), Healthcare Informatics, American Society of Anesthesiologists, etc.

Conclusion

The demand for Ambulatory EHR or practice management solution is relatively strong among the American physician community. The implementation of physician practice management solutions has the potential to reduce physician practice expenses and improve quality of care by enhancing the practice functionalities. The current EMR designs are heavily driven by billing and documentation needs, rather than by patient and provider needs around clinical management. Moreover, the lack of payment incentives and insufficient operational processes for coordination complicate the challenges clinicians face in using current Ambulatory solutions. The collaborative decision making still remains difficult without an apt solution for the outpatient care clinics.

Moreover, the passage of HITECH Act legislation in February 2009 has added a significant new set of considerations to the process of EMR/PPM selection, to advance the use of technology in healthcare and to encourage the physicians to adopt the Ambulatory solutions before the end of 2015. Thus, the regular assessment and stimulation by the U.S. Government and the HITECH Act has inspired the physician to adapt such systems to innovative their medical practice and enhance their productivity by providing quality care to their patients across the nation.

Keywords: Ambulatory EHR, Physician Practice management solution, U.S. Healthcare Market, ARRA – HITECH Act, Meaningful use, electronic claim submission

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ABBREVIATIONS

AAFP	American Academy of Family Physicians
A – EHR	Ambulatory – Electronic Health Record
ATC	Anatomical Therapeutic Chemical Classification System
AMA	American Medical Association
AMC	Annual Maintenance Contract
ANSI	American National Standards Institute
ARRA	American Reinvestment and Recovery Act
ASC	Accredited Standards Committee
ASP	Application Service Provider
ASTM	American Society for Testing and Materials
ATCB	Authorized Testing and Certification Body
BI	Business Intelligence
CCHIT	Certification Commission for Health Information Technology
CDC	Centers for Disease Control and Prevention's
CMS	Centers For Medicare And Medicaid Services
CPR	Computerized Patient Record
CPT	Current Procedural Terminology

DICOM	Digital Imaging and Communications in Medicine
EDI	Electronic Data Interchange
EHR	Electronic Health Record
EOB	Explanation of Benefits
EMR	Electronic Medical Record
EPM	Enterprise Practice Management
ERA	Electronic Remittance Advice
FY	Fiscal Year
GP	General Practioner
HCPCS	Healthcare Common Procedure Coding System
HIE	Health Information Exchange
HIPPA	Health Insurance Portability and Accountability Act
HIS	Hospital Information System
HIT	Health Information Technology
HITECH Act	Health Information Technology for Economic and Clinical Health Act
HL7	Health Level Seven
HMO	Health Maintenance Organizations
ICD	International Classification of Diseases

Inc.	Incorporation
IT	Information Technology
L2 Support	Level 2 Support
MU	Meaningful Use
NAMCS	National Ambulatory Medical Care Survey
NCHS	National Center for Health Statistics
NDC	National Drug Code
NOK	Next of Kin
ONC	Office of the National Coordinator for Health Information Technology
PEAK Matrix	Performance Experience Ability and Knowledge Matrix
PPM	Physician Practice Management
PMS	Practice Management Software
PPMS	Physician Practice Management Systems
SME	Subject Matter Experts
SNOMED – CT	Systematized Nomenclature Of Medicine Clinical Terms
U.S.	United States

PART I

INTERNSHIP REPORT

1. Company's Profile and Accomplishments

Dell Services is ranked as the No. 1 and has been tagged in the Leaders quadrant for the healthcare information technology services in the world according to the latest IT services worldwide market share report by Gartner, Inc. The report also ranks Dell as second for computer hardware support in the Education market.

Healthcare delivery and administration continues to become more complex. Uncompensated care is on the rise, demographics are changing, and patients are demanding more for their healthcare dollars. All the while, there continues to be a shortage of healthcare professionals to address the ever-demanding needs of consumers and patients. Thus, to meet ongoing challenges, Dell Services provides the right combination of clinical and business process improvements, coupled with technology to help hospitals and health systems achieve an environment that is interconnected, streamlined, efficient, and patient-focused. Its vision for the healthcare industry is simple: It wants healthy people to successfully interact with a safe, efficient, and consumer-friendly healthcare system.

The healthcare consultants and technologists at Dell Services are experienced in end-to-end hospital operations and understand how to develop, design and implement processes and technologies that bring about real provider transformation. The areas of extensive experience and expertise for Dell are as illustrated in **Figure 1.**

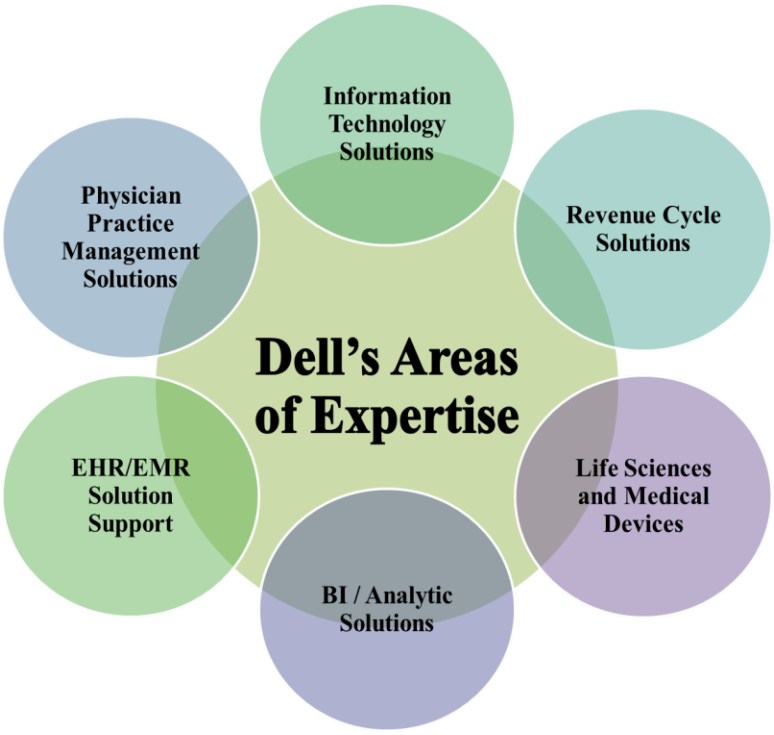


Figure 1. Dell's Areas of Expertise

Dell delivers the best healthcare possible. Whether it is a hospital, health system, or physician practice providing care, a health plan paying for care, or an integral part of the healthcare supply chain, delivering the best healthcare possible requires being responsive, efficient, accurate, and innovative in a constantly changing industry.

Every day around the globe, its mission is to provide the full spectrum of infrastructure, application, and business process solutions that are the best service possible. By leveraging its extensive expertise, they are able to provide the organizations with creative, integrated, and innovative solutions that best meet their tactical and strategic objectives.

2. Areas of Engagement

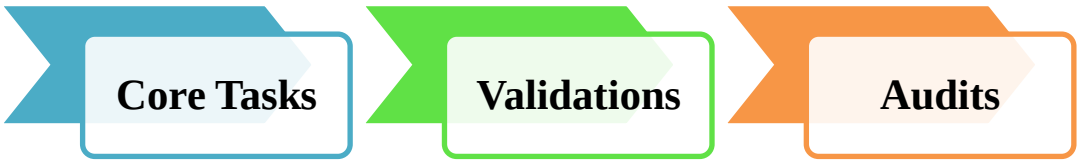
At Dell International Services, Bangalore, I was put up as a part of the "**Cerner Core Support Team"** to provide offshore L2 support for Cerner EMR to the client in U.S.

2.1. Cerner L2 Support and Tasks Performed

The Cerner Support team at Dell Services is categorized into three broad teams, these are:

i. **Cerner Core Support Team –** For the overall support to the client and onsite team requirement
ii. **Cerner Testing Team –** Performs testing of the Cerner Modules and test scripts
iii. **Cerner C3 Team –** Handles the overall backend support for the Cerner offshore team and also assist in the building the CCL queries

The various tasks performed by the Cerner Core Support Team are as follows:



3. Learning's at Dell International Services

Interning at Dell International services, Bangalore had been a valuable learning experience. The overall tenure of the internship was very much intensive and educative especially, for a fresher like me and with a limited idea regarding the healthcare IT products and their support. The knowledge imparted during the training sessions was very much informative and helpful in understanding the various EHR/EMR and HIS products namely Meditech, McKesson and Cerner and their associated modules. In addition to this, I had even undergone trainings on HIPAA Act, Dell Security and Compliance Issues and the OPAS Ticketing tool.

Moreover, the practical sessions and the hands – on trainings provided especially on the Cerner EMR modules, helped me to grasp the basic concepts and understanding our areas of engagement being a support organization. I was involved into various tasks that were assigned to me by the team lead which helped in gaining better understanding of the tasks performed.

During my internship, I as an individual was provided with the platform to learn about the tasks performed by Dell Services. Moreover, the experience of the mentor had been very useful in gaining deeper understanding about the service areas undertaken by Dell Services.

Some of the key learning's during the internship are as follows:

1) Performed various types of monthly or quarterly core tasks performed by the Cerner Core team like adding users, test patients, etc.
2) Worked on the various domains like the CRT, MCK, STG and PROD domains
3) Learnt about using the ticketing tool for accessing the generated ticket for providing support on the raised issue
4) Performed Validations of various modules associated with the Cerner EMR like the Powerchart, Scheduling, Surginet, Radnet, Pathnet, etc.
5) Performed the DBA and Generic Accounts audits as assigned by the TL
6) Provided cross – trainings to the new interns on various core tasks
7) Learnt a brief about the various types of testing performed and upgrades

PART II

DISSERTATION REPORT

CHAPTER 1.

INTRODUCTION

A larger section of the American healthcare settings is decentralized to private and independent service provider. The local physician's office contributes to almost 84% of the primary care visit. This decentralized, private and independent network has served to deliver medical services to most of the Americans; but it has also been cited as one of the reasons for the inefficient healthcare market, especially considering the quality of care coordination provided to the patients.

Nevertheless, the alterations in the physician practices appear to be a response due to a number of factors. The private and independent practices are becoming more complex to manage with the declining physicians' compensation. Therefore, the American physicians find more financial advantages for building larger practices, by adopting the newer and innovative solutions into their practices.

1.1 Classification of the U.S. Healthcare Settings

The U.S. healthcare industry has begun as a predominantly volunteer system where the patients paid little or no money for accessing the medical treatment and its related services. Today, the healthcare industry is the largest of all the industries in the United States, with a projected increase of over 3 million new healthcare employees by 2014 (BLS, 2007) into various healthcare settings.

A broad classification of the U.S. Healthcare Settings has been illustrated with the help of the following **Figure 2:**

1. ***Ambulatory or Outpatient Care Services*** – The healthcare facilities where patients are not formally admitted to the healthcare facility or had a stay of 24 hours or lesser.

2. ***Inpatient or Hospital Based and Ancillary Services*** – These services include the admission of the patient to a healthcare facility. The patients are treated for the acute and

long term care facilities along with the provision of variety of medical, nursing and ancillary services to the patients.

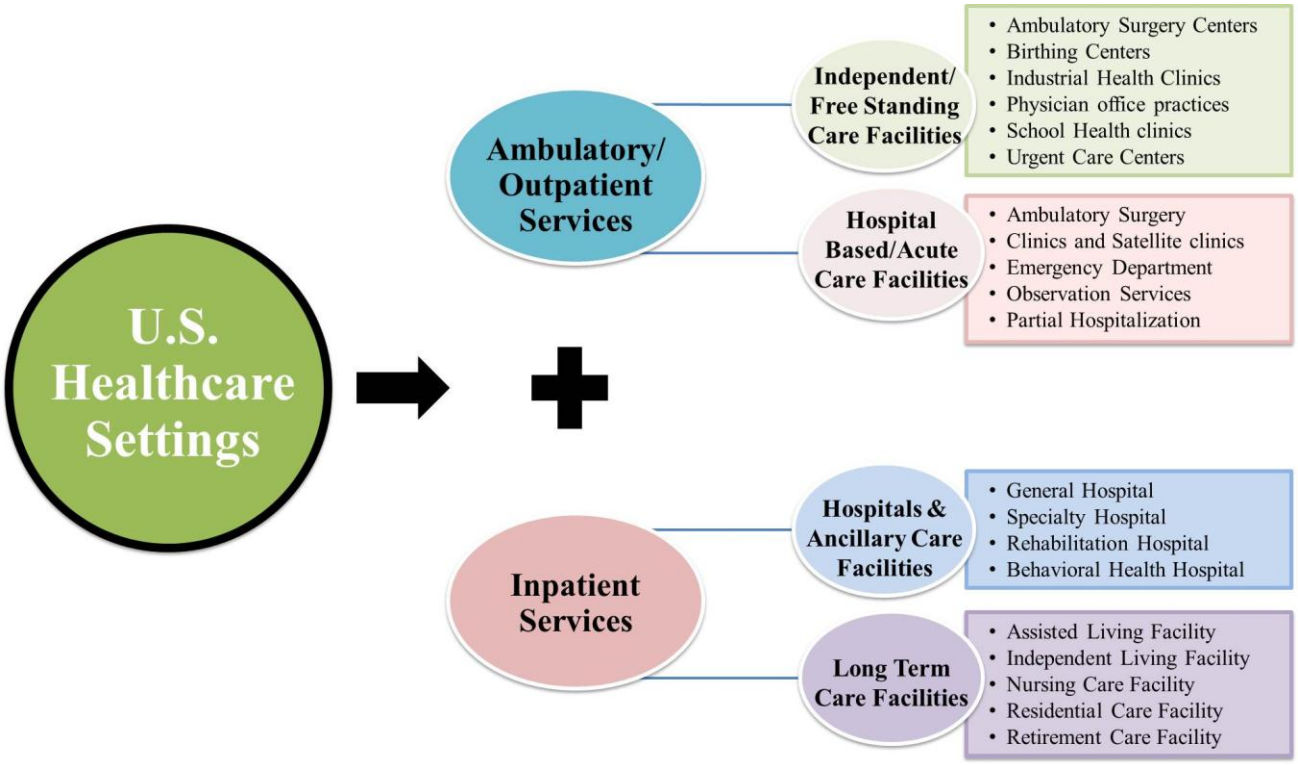


Figure 2. Classification of U.S. Healthcare Settings

Moreover, the scope of the project is majorly concerned with the Ambulatory or Outpatient services, including the acute care settings. Therefore, the inpatient care settings are not discussed in the study.

1.2 U.S. Healthcare Settings: Ambulatory or Outpatient Care Settings

Ambulatory Services are the type of healthcare services provided to outpatients, or patients who do not need to be admitted to a hospital for treatment. Ambulatory or Outpatient Care is any non-emergency or outpatient medical care delivered at a clinic (commonly known as doctor's office), physician's place or hospital for medical conditions that do not require hospital admission.

The patients mostly prefer the ambulatory care than being hospitalized. Furthermore, the care provided at this level is also substantially less expensive rather than the hospitalization cost. Many medical investigations and treatments for acute illness and preventive health care can be easily performed in an ambulatory settings, including minor surgical and medical procedures, most types of dental services, dermatology services, and many types of diagnostic procedures (e.g. blood tests, X-rays, endoscopy and biopsy procedures of superficial organs). Other types of ambulatory care services included are like the emergency visits, rehabilitation visits, and in some cases telephone consultations. Over 15,000 Ambulatory Care Centers deliver Urgent Care in the United States even in Cardiology, Obstetrics and Gastroenterology.

A wide variety of medical professionals, including doctors, nurses, paramedics, and medical technicians, can work in ambulatory settings. Moreover, some outpatient facilities specialize in addressing particular types of medical conditions. For instance, a clinic might provide chemotherapy and radiation treatments for cancer patients, dental care, or physical therapy for people recovering from accidents.

The types of Ambulatory Care Settings can be delivered broadly into two forms **(Figure 3)**:

i. ***Independent or Free Standing Care Facilities***, they are usually the type of care provided to the patients where the length of stay is mostly lesser than 6 hours or so. These services are just concerned with the basic consultation and treatment for the ailment. The ambulatory or outpatient care clinics, non-medical institution-based settings, polyclinics, ambulatory surgery centers, the urgent care centers and the doctor's office (office – based care) including specialties like family medicine, obstetrics, cardiology, dental care, etc.

ii. ***Acute care or Hospital Based Care Facilities,*** these services mostly cover the emergency care provide to the outpatients who are hospitalized for less than 24 hours. The facilities rendered at some of the emergency care clinics, day care clinics, day surgery or mental health clinics, etc. are a form of acute care services.

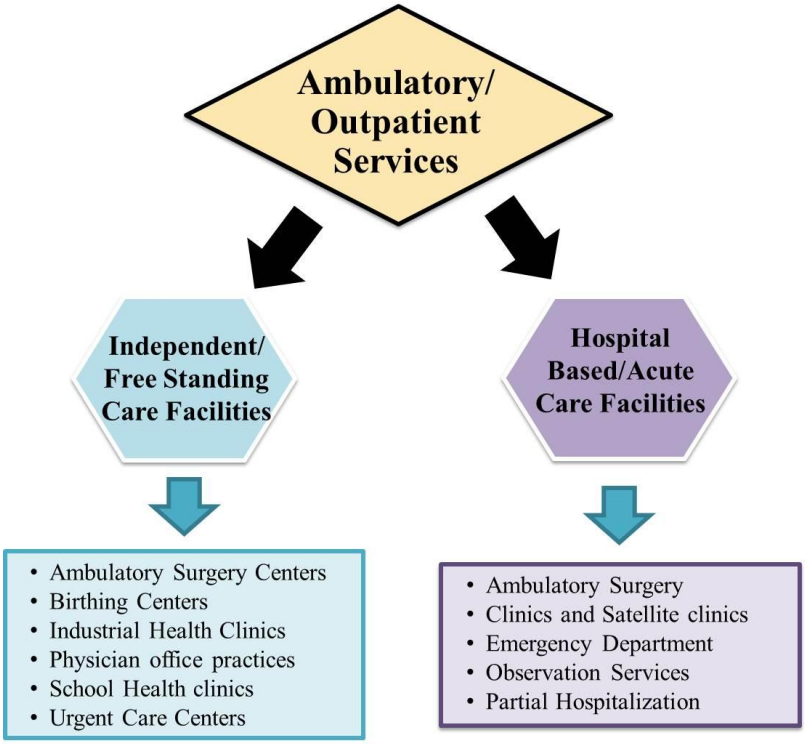


Figure 3. Categories of Ambulatory Care Settings

Additionally, the ambulatory care is a personal health care consultation, treatment or intervention which, if enhanced using the advanced medical technology or procedures can help in efficient and good quality of care to the patients. Moreover, the rapidly changing healthcare market is placing the ambulatory care physicians and group practices under tremendous pressure, to enhance and change the billing approaches, reduce costs and, most. As a result, the needs and requirements for comprehensive Physician Practice Management (PPM) systems are becoming more complex, and the demand for cost-justified systems and services also continues to grow stronger.

Moreover, the following **Figure 4** can further help in enhancing the understanding of the Information and process flow in a Physicians' office in an independent/ambulatory care setup:

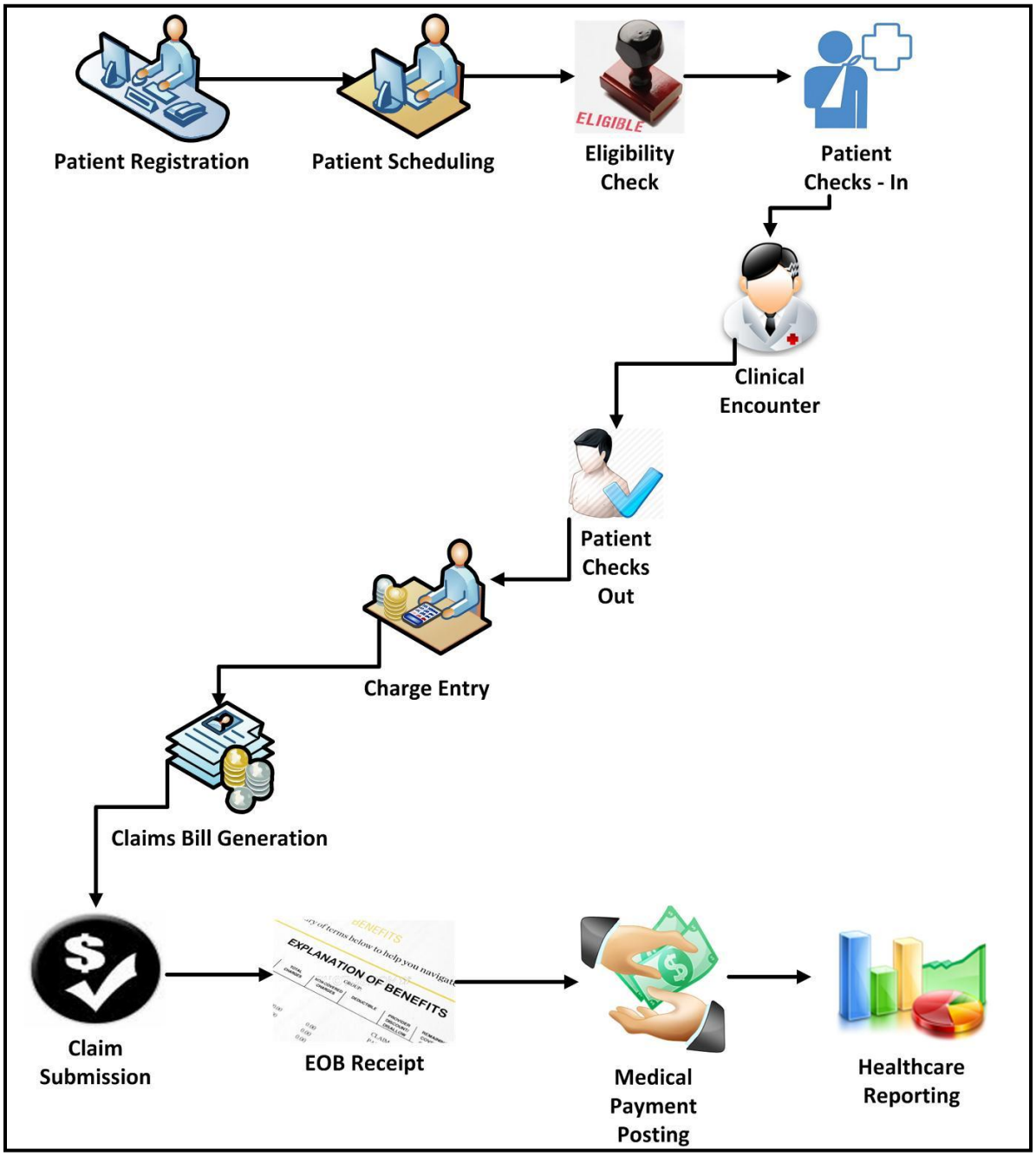


Figure 4. Administrative and Clinical Workflow of a Physician's Office

1.3 An Understanding of Physician Practice Management System (PPMS)

Practice Management refers to the independent physicians, general practitioners or practice managers who render their specialized health services and are associated with an ambulatory care clinic (also known as in-house or outpatient clinic). Clinics can be privately operated or publicly managed and funded, and typically cover the primary health care needs and are often associated with a general medical practice of populations, in contrast to larger hospitals which offer specialized treatments.

Medical Practice Management or PPM, addresses the everyday administrative and clinical operations of a medical practice which includes the general office procedures, scheduling, registration, patient arrival, consultation, medication and tests, billing, financial counseling, collections, discharging a patient, etc. In addition to this, it also includes some of the monthly administrative activities like equipment/supplies/inventory, month-end reporting, cash control, etc.

Therefore, to stay competitive in today's changing medical practice environment, it's crucial for the physicians to plan their operational success. Hence, the Practice Management System (PMS) is one of the groups of Healthcare IT solution which is designed to assists independent physician practices in dealing the day to day operations of the medical practice by providing an easy-to-use, intuitive solution to streamline their workflows and enhance care quality. Such software frequently allows clinicians to capture patient demographics, schedule appointments, maintaining lists of insurance payers, to perform billing tasks, generation of reports and to analyze their business without having a huge workforce.

Thus, PMS helps in maximizing the practice efficiency and workflow for the clinicians and is mostly inspired by small, independent clinics/medical houses and individual GP's who do not have high end and innovative IT Staff for each clinical interaction with the patient. Typically, using a PMS also involves keeping up to date large sets of data including lists of diagnosis and procedures, lists of insurance companies, referring physicians, providers, facilities, and much more. Hence, the Physician Practice Management (PPM) systems can be addressed as the automated systems that are used are for a wide variety of the clinical and administrative functions associated with an individual physician's office or a physician's group practice.

Furthermore, the elements or components of the physician practices can be categorized as (**Figure 5)**:

- ✓ Core Elements
- ✓ Advanced Elements and
- ✓ Specialized Elements

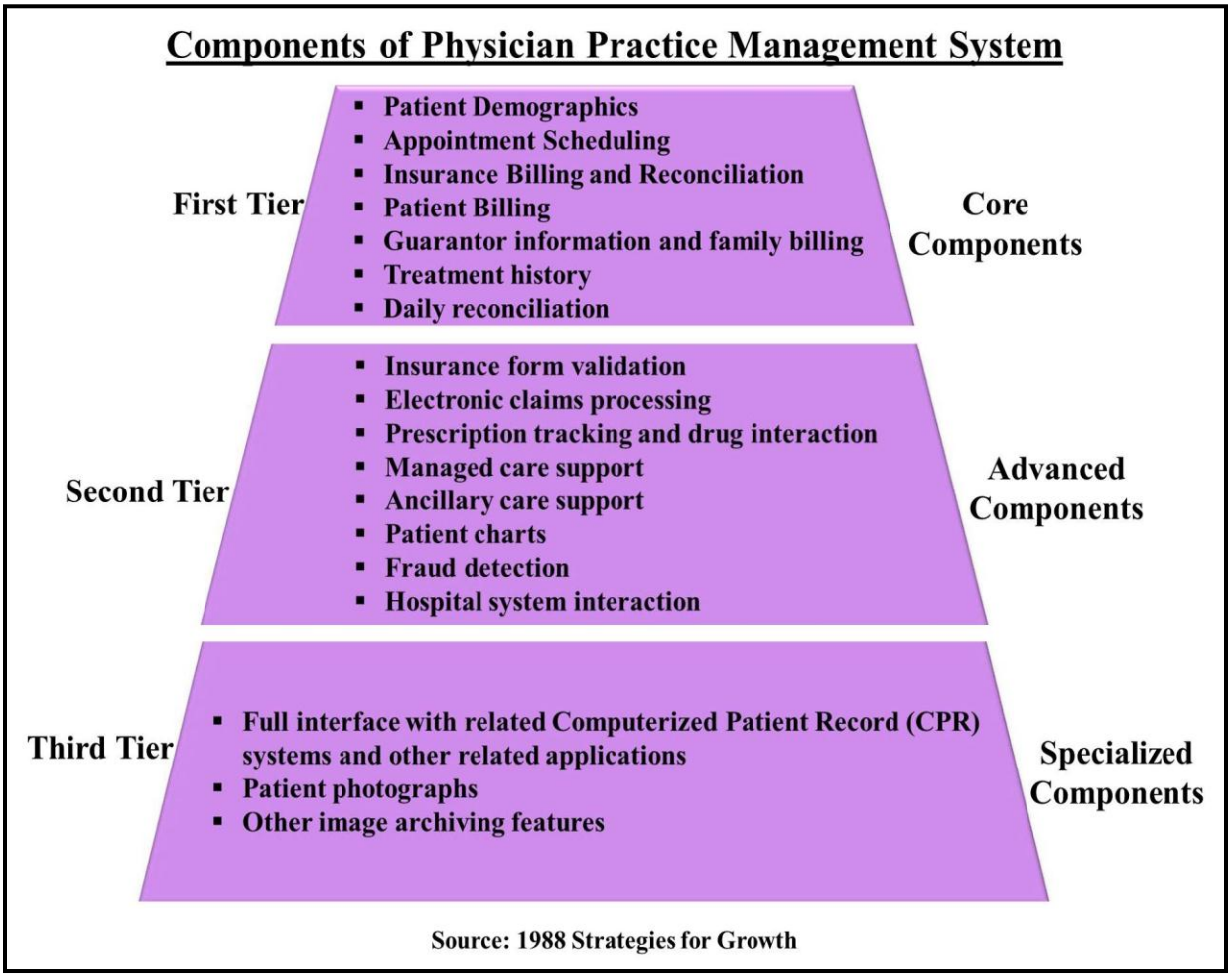


Figure 5. Components of PPM System

1.4 Physician Practice Management Systems: Basic Functionalities

Most of the PPM software allow users / clinicians to enter and track patients, schedule and track patient appointments, send out insurance claims and patient statements as part of the collection process, to process insurance, patient and third party payments, and generate reports for the administrative and clinical staff of the practice and to use the software as an BI Tool to monitor their business / medical practice.

The various components of PPM system can be categorized as:

1) Patient Registration

It is often associated to the patient information chart which is provided by the patient itself on his/her first visit to the clinician. It makes the registration process simple and improves the service level by centralizing billing and demographics details at the first stage of the patient encounter.

The information which is included is the patient's name, address and contact information, birthdate, NOK, employer, and insurance information. Typically, it is the responsibility of the Practice staff to enter this information into the software for the clinician. The software also has the ability to automatically verify the patient's eligibility for receiving benefits with the insurance company using the standard electronic data interchange (EDI) connection.

Some of the Patient Registration Highlights are:

- Entering patient demographics
- Assignment of patient responsibility and track guarantor status
- Assign default templates especially for CMS-1500 forms
- Ability to view a snapshot of the patient’s ledger and previous billing history
- Verification of the insurance eligibility for the respective patient prior to billing
- Sending out alerts and reminders to the associated patients for any type of clinical information

Other features include the option to create patient-related notes and set them as alerts or collections notices for patients through SMS, E-mail or postal services.

Figure 6. Core Functionalities of PPM Systems

2) Appointment Scheduling

With the help of appointment scheduling the clinician or the practice staff can easily create and track upcoming patient visits with the help of the calendaring or scheduling component of PMS. It aids in handling multi-physician, multi-day, or multi-office schedules. The schedules or the appointments are often color – coded based on physician, patient, appointment reason or check-in status to allow healthcare providers (i.e. doctors, nurses, assistants) to easily identify the time blocks and the sets of patients.

Some of the Appointment Scheduling Highlights are:

- Ability to Scans for next available appointment times
- Schedules for multiple appointments
- Offers multiple views and customizable settings for appointment time increments and appointment reason reservations
- Tracks patient flow with a time-stamped record of arrival, check-in, visit and departure time
- Tracks co-pays, no-shows and cancellations

3) Billing, Claims and Statements

The Billing, Claims and Statements give you better control over patient balances and past-due accounts corresponding to a particular service/diagnosis that was performed on the patient. The users can view easy-to-understand patient statements/charges, broken down by visit, minimize outstanding patient co-pays, and keep an audit of the billing activity.

Most charges are based on the codes from the Healthcare Common Procedure Coding System (HCPCS) or its subset, the Current Procedural Terminology (CPT). The diagnoses are mostly indicated using International Classification of Diseases (ICD) codes.

In some cases, the patient carries a valid private or public insurance policy/coverage. The charges are then taken as an insurance claim which is submitted electronically to the electronic claim clearinghouse using industry based electronic data interchange standards. Once a claim is

adjudicated by the payer, a response is sent back to the submitter. This usually comes as Explanation of Benefits (EOB) or an Electronic Remittance Advice (ERA) describing the actions taken by the payer on each claim i.e., the amounts paid, denied, adjusted, etc.

4) Reporting

Perpetually, the process of running a medical practice requires some introspection which also serves as one of the major features and benefits of PMS. Practice management software usually contains reporting capabilities which allows users to extract detailed data to report statistically and analytically on financial performance, administrative productivity and patient/clinical activity for better business insight. The reporting functionality of PMS is mostly interfaced with the decision support systems and automatically generates performance summaries and management reports with graphical representation for real-time data analysis. Hence, the PMS provides a better in-depth analytics of the business which further aids in making of informed management decisions for enhanced performance and business growth.

1.5 Physician Practice Management Systems: Regulatory Guidelines, Interfaces and Dependencies

The latest ARRA act signed by the Congress constitutes of the HITECH Act which talk about the adoption of newer Healthcare IT solutions in order to improvise on the healthcare outcomes in the United States. The ARRA – HITECH Act **(Figure 7)** implemented in order to improvise the impact CMS and ONC Rule for the Meaningful use and certified EHR, leading to stimulus funding **(Figure 8)** for the eligible professionals. In addition to this, the passage of ARRA – HITECH Act lead to quality enhancement, cost reduction and overall standardization in the healthcare settings with increased and improved care rendered.

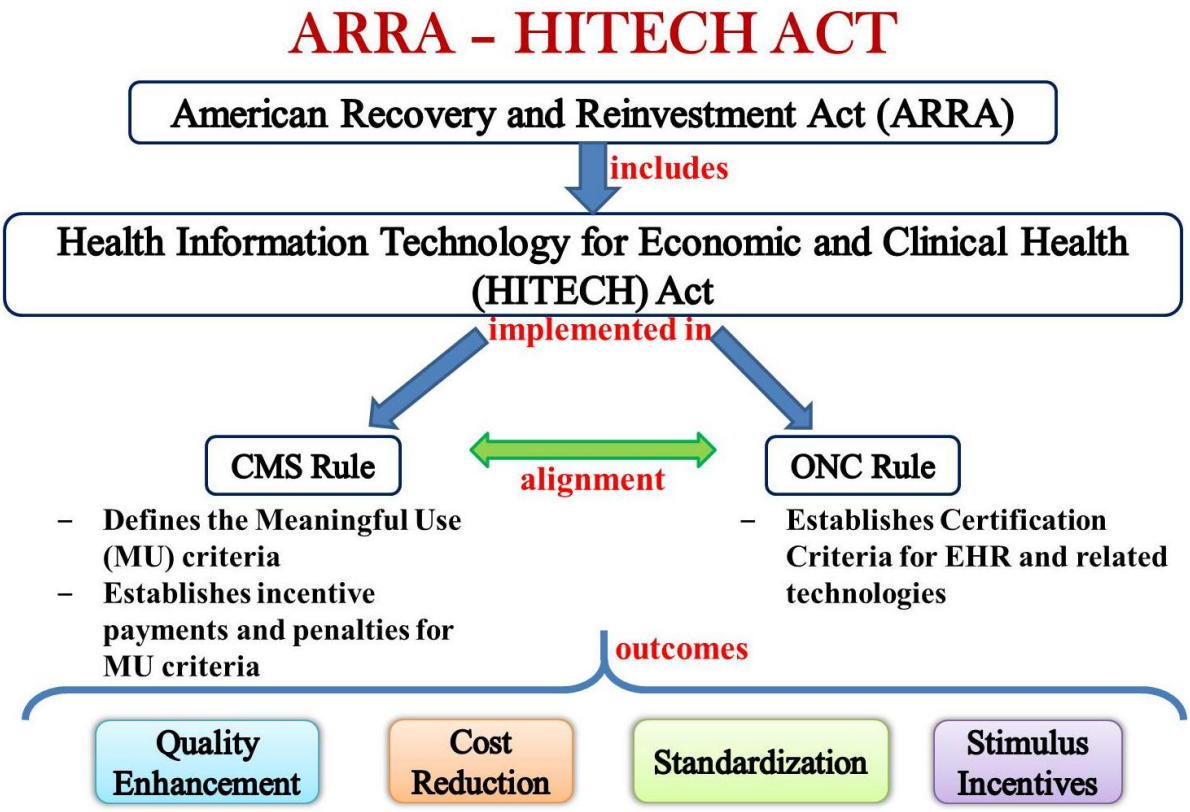


Figure 7. ARRA – HITECH Act

Year	2011		2012		2013		2014		2015		2016	
	Medicare	Medicaid	Medicare	Medicaid	Medicare	Medicaid	Medicare	Medicaid	Medicare	Medicaid	Medicare	Medicaid
2011	$18,000	$21,250							Penalties start for Medicare		Penalties	
2012	$12,000	$8,500	$18,000	$21,250								
2013	$8,000	$8,500	$12,000	$8,500	$15,000	$21,250						
2014	$4,000	$8,500	$8,000	$8,500	$12,000	$8,500	$12,000	$21,250				
2015	$2,000	$8,500	$4,000	$8,500	$8,000	$8,500	$8,000	$8,500		$21,250		
2016		$8,500	$2,000	$8,500	$4,000	$8,500	$4,000	$8,500		$8,500		$21,250
2017				$8,500		$8,500		$8,500		$8,500		$8,500
2018						$8,500		$8,500		$8,500		$8,500
2019								$8,500		$8,500		$8,500
2020										$8,500		$8,500
2021												$8,500
Total	$44,000	$63,750	$44,000	$63,750	$39,000	$63,750	$24,000	$63,750	$0	$63,750 – (1% Penalty)	$0	$63,750 – (2% Penalty)

Figure 8. ARRA – HITECH Incentives for the Eligible Professionals

Moreover, in addition to rules and regulations, the practice management systems are often needed to be interfaced with the outside world. Therefore, there are some of the most commonly and widely used HIT standards which are:

- **HL7**, the most worldwide used standard for the exchange, integration, sharing, and retrieval of electronic health information between physician offices, hospitals, or EMR systems.

- **ICD/ CPT /SNOMED – CT,** based on the type of standard chosen, the coding is done for diseases, signs and symptoms, abnormal findings, complaints, social circumstances, external causes of injury or diseases, procedures and healthcare services.

- **DICOM,** the standard used for handling, storing, printing, and transmitting information in the form of medical imaging between two or more entities.

- **NDC/ATC**, are codes used for the identification and classification of drugs.

- **ASTM E31.17 & E31.20**, commonly used standards for Confidentiality, Privacy, Access, and Data Security of patient's health information.

  - **E31.17 –** Access, Privacy, and Confidentiality of Health Information to develop policy standards that address access, privacy, confidentiality, and data security of health information in its many forms and locations.
  - **E31.20 –** Data and System Security for Health Information to develop security service and mechanism standards for healthcare information and systems.

- **ANSI X12,** widely used for electronic data interchange (EDI) transactions, including:

  - 270 — eligibility & benefit inquiry
  - 271 — eligibility & benefit response (response to 270)
  - 276 — claims status inquiry (follows 837 submission)
  - 277 — claim status response (response to 276)
  - 835 — claim payment/advice (follows 837)
  - 837 — medical claim is paid, and amount of payment and the patient's financial responsibility
  - 837D — claim submission for dental claims
  - 837I — claim submission for institutional claims
  - 837P — claim submission for professional claims

In addition to above stated standards, for achieving the goals of meaningful use and receiving the set incentives, the physicians and even other healthcare enterprises have been instructed to adopt the healthcare solutions that are certified for MU. Some of the approved and authorized certification by ARRA and the U.S. Government are:

- **ONC – ATCB & ONC – ATCB MediaDent IX**
- **2011 CCHIT Certified Ambulatory EHR + Child Health**

Moreover, a practice management center could require a PPM system to support 200,000 or more patient cases annually, and can have large number of practice staff and clinicians who will be using the system. The most critical functions managed by the system are likely to include

patient registration, appointment scheduling and patient billing. Other important functional considerations typically include accounts receivable, cashiering, contract management, third-party billing, general ledger, payroll and medical records. Therefore, for most of the physicians' offices and group practices, the standardization of their managed care data collection, practice procedures and reporting is integral to their operational strategy.

Furthermore, there is also an increasing demand for developing practice management systems which can easily interfaced with Computerized Patient Record (CPR) systems in order to provide physicians and group practices with truly integrated systems that manage not only patient records, medical reports, scheduling and administrative functions, but the entire practice, as a business. Thus, for coming up with an integrated PPM system, many of the vendors that have historically offered only PPM or CPR systems are now offering both in form of Enterprise Practice Management (EPM) system, or at least partnering with other vendors that can complement their more narrowly focused product lines.

Looking forth from the patient's perspective, many of the medical services and procedures that had historically been performed at a hospital, can now easily be performed at a more conveniently located ambulatory facility. Moreover, from the physicians' perspective, they feel that they have more control over their own practices, including key areas as practice management, financial management and general business autonomy. However, from the services providers' perspective, the individual physician and group practice segments represent clearly defined, fast-growing, technology-oriented, equipment-populated segments generally willing to pay for premium levels of service and support.

The physicians and group practices have also become increasingly involved in interfacing with insurance systems, managed care systems and health maintenance organizations (HMOs). As a result, PPM systems have also begun to follow suit, offering such key features as:

- **Claims verification** - which examines insurance claims forms before submission, to minimize mistakes and payment delays;
- **Electronic filing** - which transmits directly to the insurer or claims clearinghouse for more rapid processing; and

- **Co-pay calculation** - which aids office staff in processing patients through the system.

Hence, nowadays many PPM systems can also be interfaced with an enterprise's ancillary systems (such as laboratory or radiology) to maintain complete patient histories. As sharing of health information with the medical record system is also highly desirable. In addition to this, some of the practice management systems may also interface with remote third-party systems that can electronically link with independent data centers. Furthermore, most of the PPM systems are adopted to produce patient accounts receivables, day sheets for daily reconciliation, bank deposit slips and patient payment coupons books, tracking insurance details and produce the appropriate documentation for health maintenance organizations. Thus, PPM is the highly time saving and the most enhanced innovations in the healthcare market, which is in demand to improvise on the medical practices for the American Physicians.

CHAPTER 2.

PROJECT CONCEPT

2.1 Project Scope

The report describes the extent to which the American physicians are using the practice management systems to improvise their medical practice to sustain in the U.S. healthcare market through 2011. The study majorly focuses on understanding the practice management solution, its adoption by the physician community, the U.S. PPM market trends and the future of PPM for the U.S. healthcare market.

2.2 Objectives of the Study

The main objective of the study is to do an Analysis of the Physician Practice Management System. Moreover, the specific objectives include:

- Understanding of the Physician Practice Management Systems and its need
- Analyzing the current state of Ambulatory practice
- Adoption rates and Market Analysis of the Medical Practice Management Solutions
- Future prospects of PPM for the U.S. healthcare providers

2.3 Research Methodology

This qualitative study was conducted at Dell International Services, Bangalore

2.3.1. Research Design: The study involved the descriptive and exploratory analysis of all forms of secondary data from various sources. It is a purely a Qualitative study which is a descriptive, exploratory and instrument in nature.

- *Descriptive Study:* This type of case study is used to describe an intervention or phenomenon and the real-life context in which it occurred
- *Exploratory Study:* Exploratory research is broad in focus study and often involves literature search based on secondary research such as reviewing available literature and/or data, Internet research, or qualitative approaches such as informal discussions with

consumers, employees, management or competitors. The main objective of exploratory research is to identify key issues and key variables for the study. In essence exploratory studies are undertaken to better comprehend the nature of the problem since very few studies might have been considered in that area. Thus, the exploration of new phenomena in this way may help the researcher's need for better understanding, or determine the best methods to be used in a subsequent study.

- *Instrumental Study:* The instrumental study is mostly done to accomplish something other than understanding a particular situation. It provides insight into an issue or helps to refine a theory. It is mostly considered as a study for secondary interest which plays a supportive role in facilitating understanding of situation. The study is often looked at in depth, by scrutinizing its context with detailed activities, leading to pursue the external interest as an important aspect of the study conducted.

2.3.2. Pre – Requisite of the study

Before starting with the actual study; the various activities, the workflows and information flow that are involved in an Ambulatory and Acute Care setting for the independent American physicians were read and understood thoroughly to have a better insight on the need and use of PPM for the American Physician community. In addition to this, the impact of ARRA – HITECH Act, Meaningful Use and HIPAA Act was even understood and analyzed.

2.3.3. Type of Data

The data were collected through the triangulation of the secondary data from various sources, which were in form of:

a) Literature available about Medical Practice Management solutions or PPM/PPMS
b) PPM/PPMS brochures from the Vendors
c) Studies, surveys and Journals on PPM
d) Books, websites etc.
e) Audio and Videos for PPM by Vendors

2.3.4. Sample Population

The target populations' taken into account are the independent American Physicians' working in the Ambulatory and Acute Care settings**.**

2.3.5. Tools used for the study

MS Office Excel 2010; MS Office Visio 2010; MS Project 2010, MS Office Word 2010, Adobe Acrobat Reader, You Tube, Windows Media Player and Picasa 3.

2.4 In Scope of the Project

- Understanding the U.S. Healthcare Setting especially the Ambulatory care settings
- Market Landscape and Vendor analysis
- Analysis of top rated Support Service organizations and the Support services for PPM Implementation
- Future prospects and trends for PPM adoption in U.S. Healthcare Market

2.5 Work Plan

Task ID	Task Name	Start Date	End Date	Duration	Feb 2013			March 2013				
					8/2	15/2	22/2	1/3	8/3	15/3	22/3	28/3
1	Project Assignment & Parameter Designing	08/02/2013	10/02/2013	3d								
2	Project Protocol Designing	11/02/2013	16/02/2013	6d								
3	Literature Survey	17/02/2013	04/03/2013	16d								
4	Methodology Adopted	04/03/2013	06/03/2013	3d								
5	Data Collection	07/03/2013	18/03/2013	12d								
6	Data Compilation & Analysis	19/03/2013	22/03/2013	4d								
7	Documentation	23/03/2013	30/3/3013	8d								
8	Submission of First Draft to the Advisor	31/03/2013	31/03/2013	1d								

2.6 Limitations of the Project

- The study is purely qualitative and has been referenced from multiple secondary sources
- The analysis is based on the latest available 2010's and 2011's data
- The study concentrates more on the stand alone PPM solutions as compared to the integrated one's
- The subscription fee for the top four PPM products is in approximation and therefore, the actual cost of adapting the PPM system may differ than mentioned.

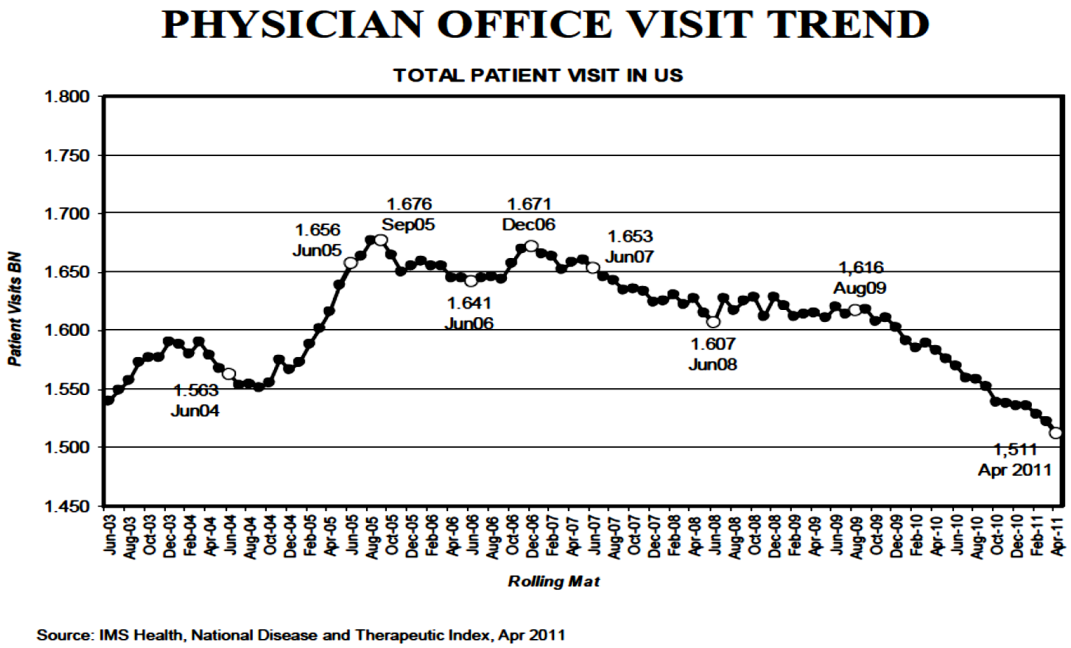
CHAPTER 3.

MARKET LANDSCAPE

3.1 U.S. Healthcare Market Trends: Ambulatory and Acute Care Settings

The American ambulatory and acute care setting is nowadays the fastest growing segment of the healthcare industry, with approximately two-thirds of physicians performing under some form of managed care program. This segment is expanding by at least 5% per year as leading practices continue to consolidate in order to offer additional services under the managed care system. Concurrently, the market for physician practice management solutions and electronic medical records is becoming enormous, with physicians becoming increasingly mobile and requiring stronger support from their more advanced and flexible computer systems to enhance and facilitate their medical practice as well as the care coordination both for administrative and clinical undertakings.

Modern health care has evolved to become a multi-disciplinary, complex and interdependent functions built around highly capital intensive and intellectual resources. Despite of the 0.8% to 1% per year population growth, the physicians' office visits have declining by more than 10% **(Figure 9)**.



Source: IMS Health, National Disease and Therapeutic Index, Apr 2011

Figure 9. Trends of a Physician's office Visits

Also, it is surprising to note that the American physicians spend more than half of their hours in a week dealing with billing as their Canadian colleagues, but their office staff spent more than eight times as many hours (20.6 per week per physician) for the same.

According to the Centers for Medicare & Medicaid Services (CMS), physician services spending in 2010 increased only 1.8% in the United States, less than 40% of the rate of hospital spending growth. Furthermore, in contrast, the net societal cost of private health insurance also rose by 8.4% in 2010. Overall, as can be seen in **Figure 10**, physician and clinical services spending lagged significantly behind overall growth in U.S. health care spending over the past few years.

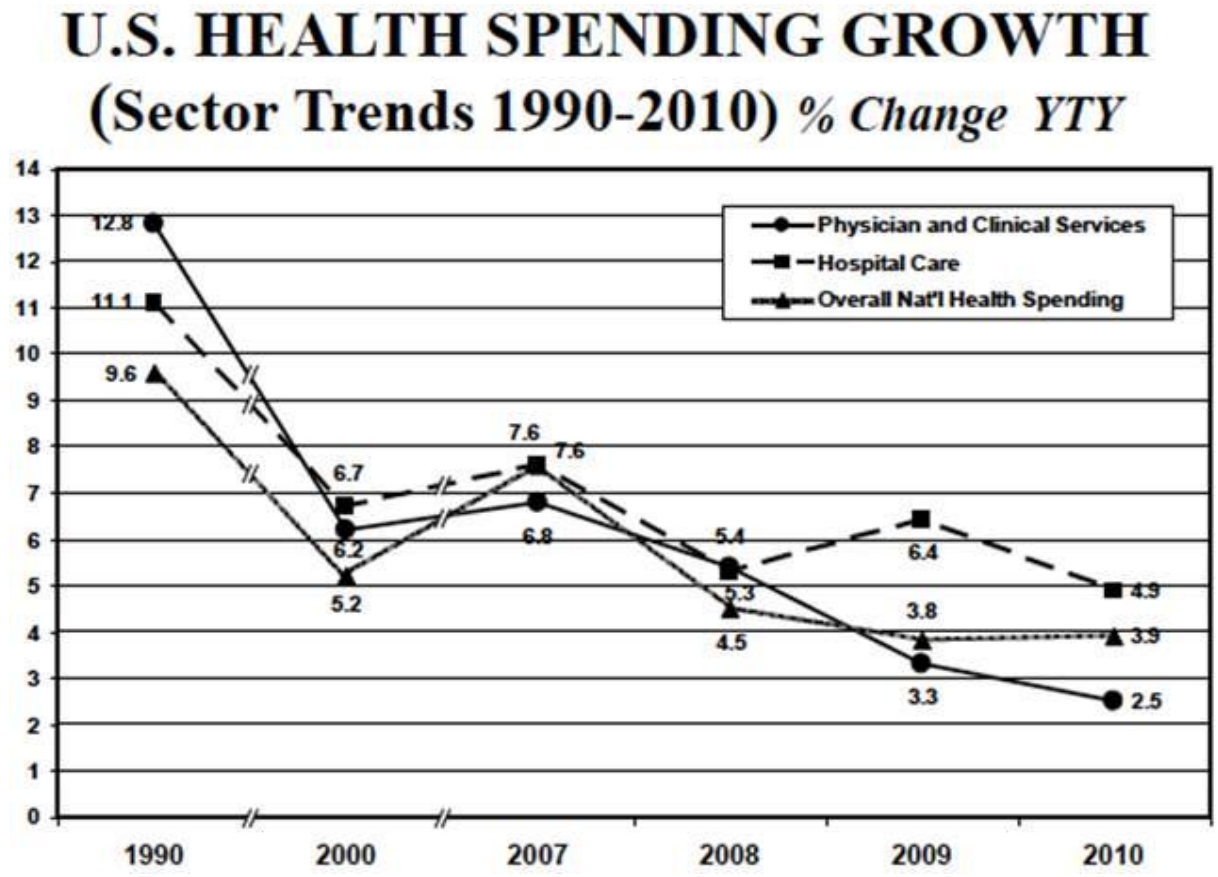


Figure 10. <u>U.S. Spending on the various Healthcare Services</u>

Despite the reality that physician practice is consolidating, according to the Center for Studying Health System Change Tracking Study, as late as 2008, 47% of physicians were still practicing in groups of five or fewer and 32% were in solo or partnership practices **(Figure 11)**. The ongoing changes in the physician's practice environment have given rise to a large segment of physicians managing the patient care through the Ambulatory setups (surgery, imaging, outpatient clinics, day care centers, etc.).

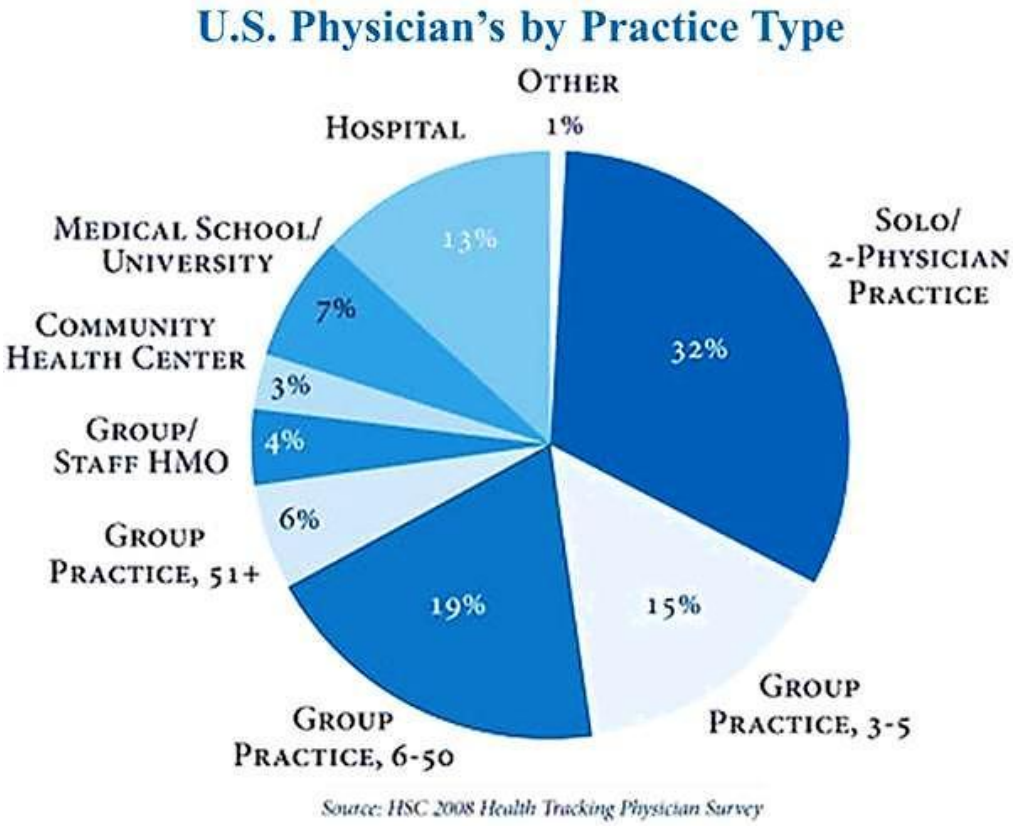


Figure 11. Percentage of U.S. Physician's categorized based on their Practice Type (2008)

Furthermore, the second Ambulatory EHR and Practice Management study which was conducted in June of 2010 by CapSite Healthcare Consulting, Williston, Vt. **(Figure 12)**, depicts that the group of less than 10 physicians out of the 2,186 physician groups in the U.S (sample size for the study) represented the largest segment of the market with almost 99% confidence level with a confidence interval of +/-3 for the study.

Physician Groups	# of Physicians
1-2 Physicians	107,476
3-10 Physicians	248,887
11-25 Physicians	92,542
26-100 Physicians	48,835
101+ Physicians	11,540
Total	**509,280**

Source: SK&A

Table 12. Total Number of Physicians Categorized based upon the Practice Type (2010)

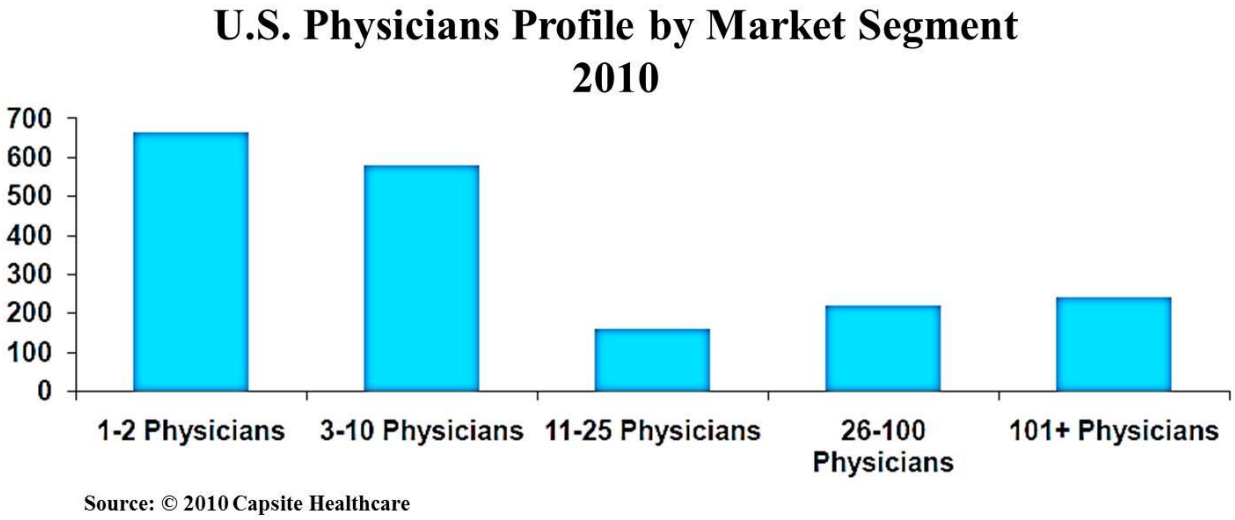


Figure 13. Percentage of U.S. Physician's based categorized based on their Practice Type (2010)

Also, in the current study (CapSite Healthcare Consulting), it is interesting to note that the major segment i.e., 60% **(Figure 14)** of the care coordination falls under the free-standing (Ambulatory and Acute care setting) physicians of the U.S healthcare.

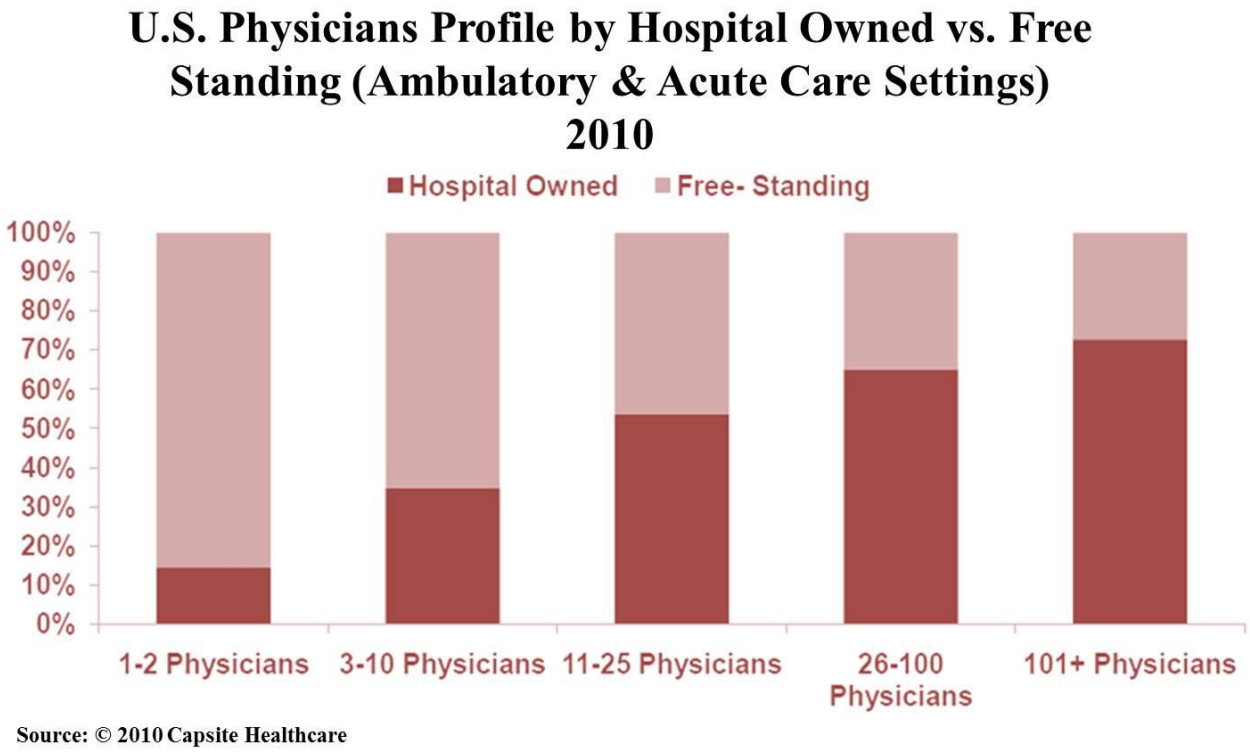
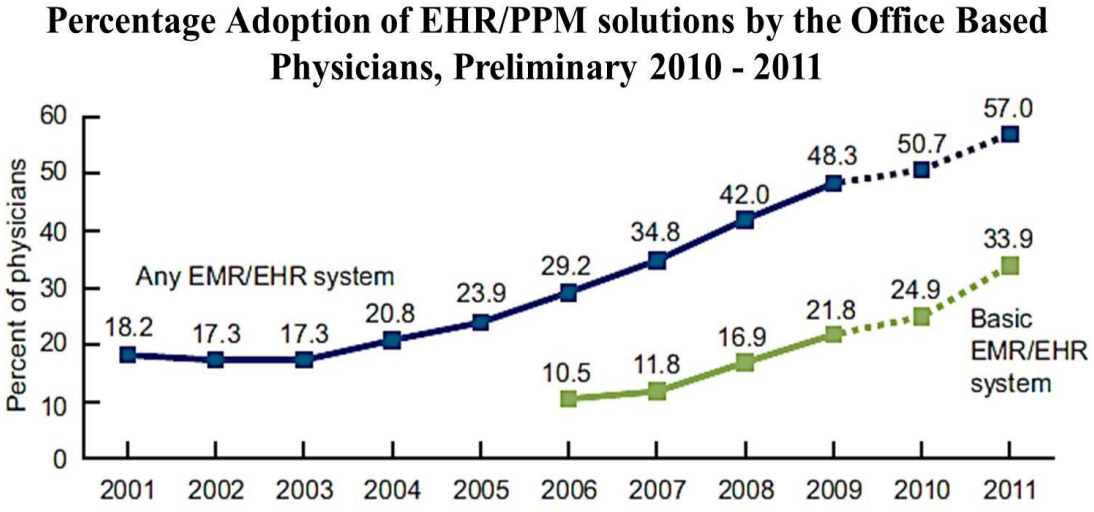


Figure 14. <u>Physician's Profile Based on the type of Healthcare Service</u>

3.2 U.S. Ambulatory and Acute Care Settings: EHR/PPM Adoption Trends

Nevertheless, the new charter of the healthcare industry is now focusing on the ability to provide better quality of healthcare, while reducing both enterprise and patient costs. Thus, to achieve this goal, most independent physicians have shifted away from the use of historically expensive patient care to a more cost-efficient mode of outpatient procedures and practices. Hence, this shift in the care coordination also requires that patient records become more complete and accessible, available at multiple sites, as well as to multiple service providers which is mostly attained either by stand – alone Ambulatory EHRs or through the adoption of modern integrated EPM solutions. Furthermore, the above stated could be well justified by the following **Figure 15**, which represents the recent adoption rates by the independent (or ambulatory or office based) physician of U.S. It depicts that, the use of EMR/PPM system among office-based physicians has increased from 18% in 2001 to 51% in 2010 and around 57% in (12% increase from the 2010) in 2011 (preliminary estimates) (NAMCS 2011). Also, the survey states that, about 34% of EHR/PPM adopters reported that they met the criteria for a basic system which showed an increase of about 36% in 2011 than the previously reported of 25% in 2010.



Notes: "Any EMR/EHR system" is a medical or health record system that is all or partially electronic (excluding systems solely for billing) whereas, the "Basic EMR/EHR system" (are a type of EPM) are the fully functional electronic systems with a provision for billing and claims. Data for 2001–2007 are from the in-person National Ambulatory Medical Care Survey (NAMCS). Data for 2008–2009 are from combined files (in-person NAMCS and mail survey). Data for 2010–2011 are preliminary estimates (dashed lines) based on the mail survey only. Estimates of basic systems prior to 2006 could not be computed because some items were not collected in the survey. Data include nonfederal, office-based physicians and exclude radiologists, anesthesiologists, and pathologists.
Source: CDC/NCHS, National Ambulatory Medical Care Survey

Figure 15. Percentage of EHR/PPM Adoptions by independent Physicians (2010-11)

Furthermore, as per the Capsite 2010 survey **(Figure 16)**, it has been found that, there has been a 29% of increase in the investment/purchase of an Ambulatory EHR/PPM solution.

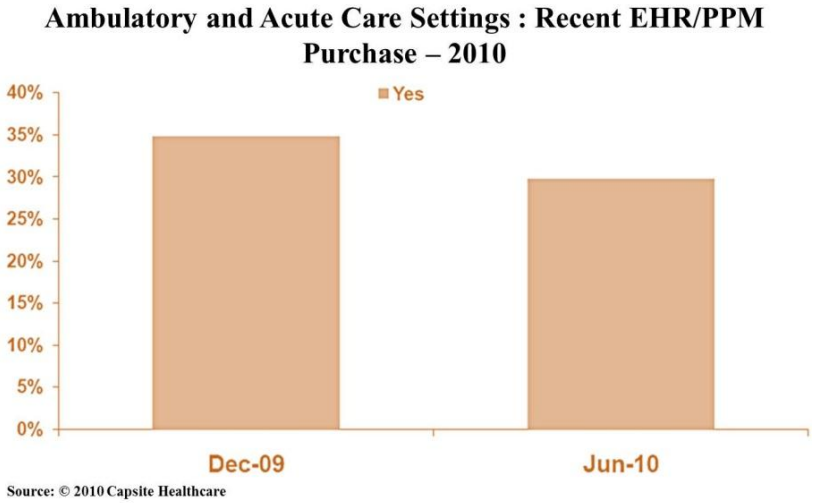


Figure 16. Recent Purchase rates of EHR/PPM among the Ambulatory Care Services

Moreover, as reported by the National Ambulatory Medical Care Survey (NAMCS - 2011) conducted by CDC/NCHS, the **Figure 17** depicts that about 21% of the ambulatory physicians have already purchased/ adopted the Ambulatory EHR, around 26% of non – adopters reported they are still in process of purchasing an EHR system within 12 months, about 33% of the physicians reported having no intention to purchase any kind of EHR/PPM solutions and almost 20% of the physician are still dithering whether to purchase one or not purchase within 12 months.

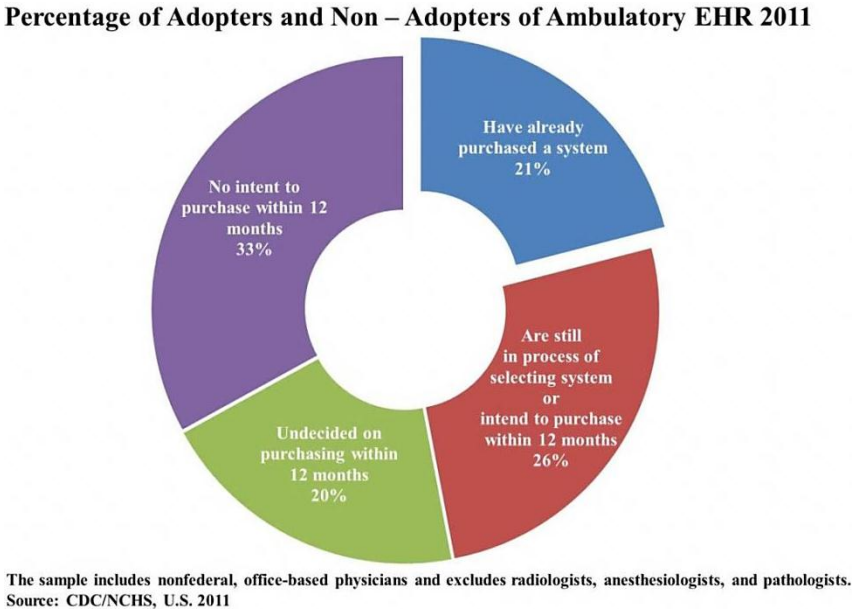
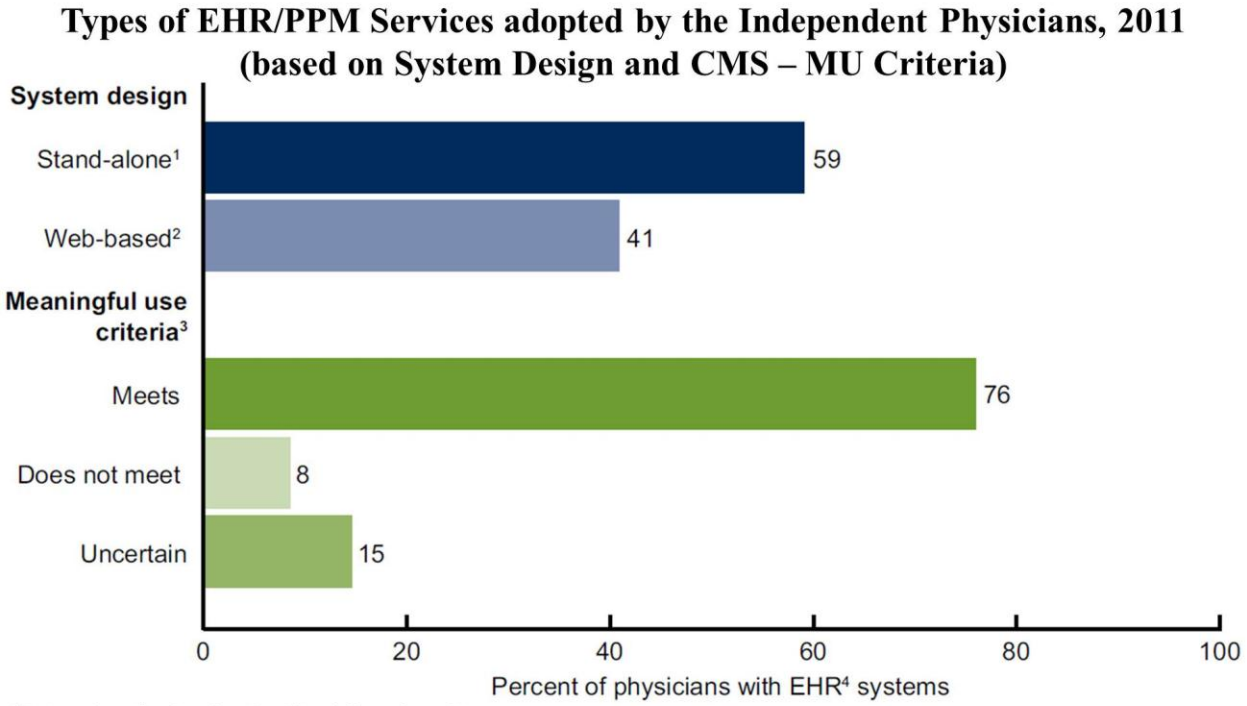


Figure 17. Percentage of EHR Adopters and Non – Adopters (2011)

It is mostly seen that, about 76% of adopters have a system that currently meets the Centers for Medicare & Medicaid Services (CMS) MU criteria, whereas 8% have a system that does not meet the CMS MU criteria. Furthermore, about 15% of respondents are uncertain whether their system meets MU criteria. Most of the adopters i.e., around 59% have reported that they have a stand-alone, self-contained system, rather than that of the 41% of the Web-based system adopters **(Figure 18)**.



[1]Data and application functionality delivered on-site.
[2]System hosted and data stored off-site.
[3]Defined by Centers for Medicare & Medicaid Services.
[4]Electronic health record.
The sample includes nonfederal, office-based physicians and excludes radiologists, anesthesiologists, and pathologists. Missing values are excluded, therefore, the percentages may not sum to 100%.
Source: CDC/NCHS, 2011

Figure 18. Adoption Trends of EHR/PPM based on the System designs and CMS – MU Criteria

The following **Figure 19** illustrates the total cost of ownership that an independent American physician has to pay for purchasing the Ambulatory EHR/EPM software excluding the hardware cost for the software.

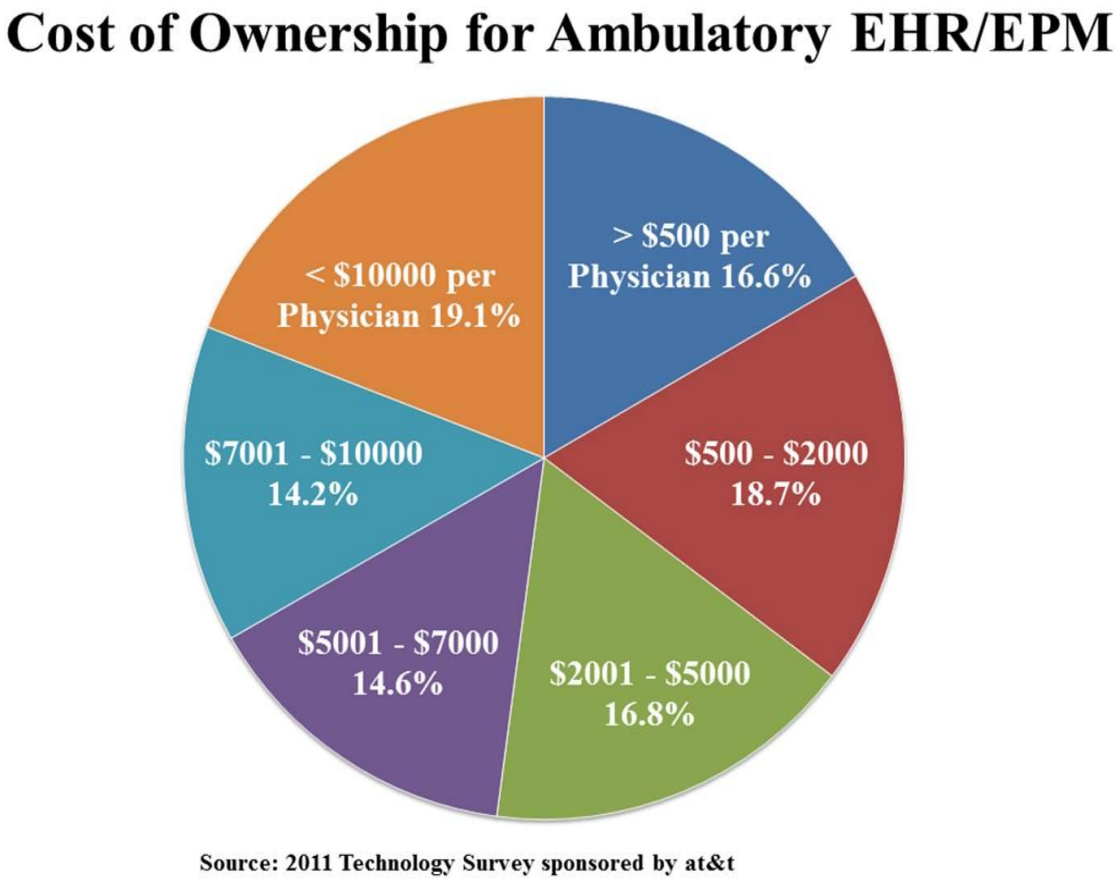


Figure 19. Cost of Ownership for Ambulatory EHR/PPM Systems

Furthermore, the following **Figure 20** depicts the total lease cost incurred by an independent American physician per month for adopting the Ambulatory EHR/EPM solution in form of lease for having access to the EHR/EPM solution and also to its related services.

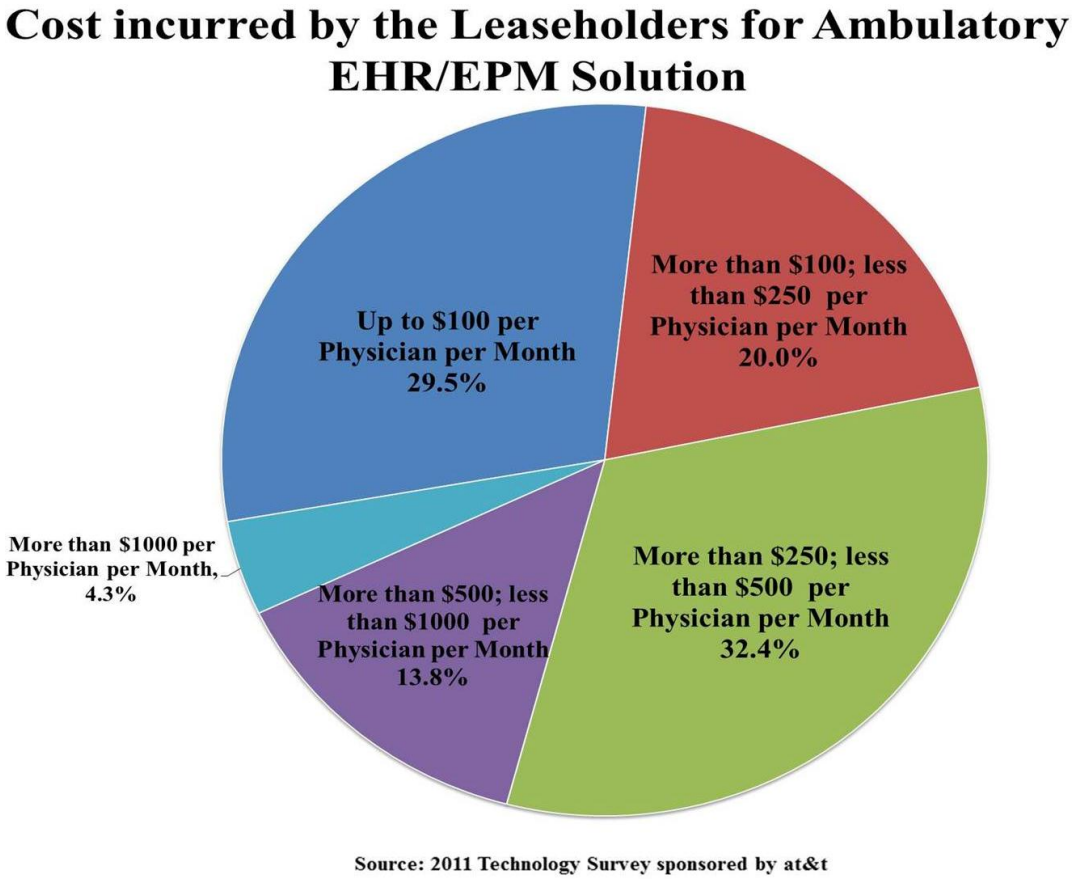


Figure 20. Ambulatory EHR/PPM costing for the Leaseholders

During the survey (Capsite 2010 **Figure 21**), the independent physicians were even asked about the most important reason for purchasing an Ambulatory EHR/EPM solution. To which, a majority of respondents concluded that the purchase of the solution would to make their practice more efficient, while the second most important reason was that the solution would increase the quality in healthcare rendered to their patients. Although, receiving stimulus incentives from ARRA certainly acts as a catalyst for the adoption of EHR/PPM solutions; but only 18% of respondents, noted it as the most important reason to be taken into consideration for adopting the required solution.

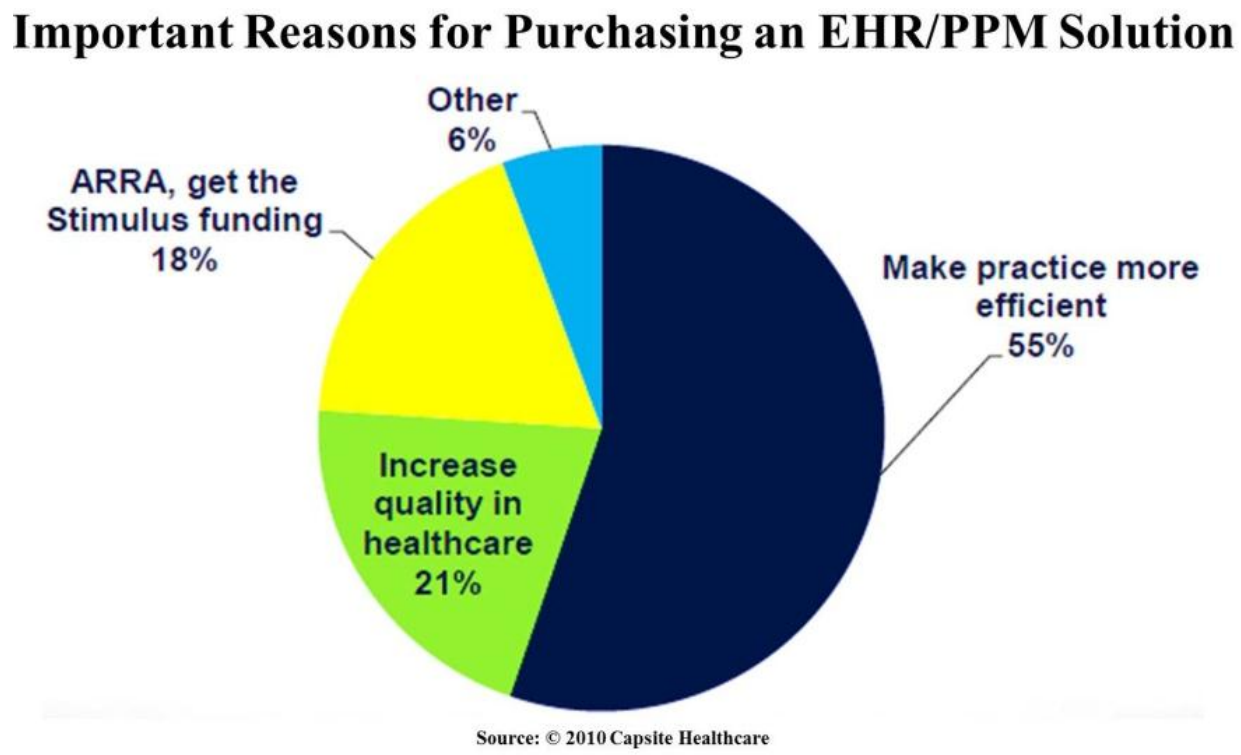


Figure 21. Physician's Reasons for EHR/PPM Purchase

Furthermore, when asked from the respondents for Capsite's 2010 survey about the reasons for not purchasing an Ambulatory EHR/PPM solution **(Figure 22)**; then the majority of the respondents i.e., almost 26% listed cost as the primary reason for not planning to adopt an Ambulatory EHR/EPM solution. Additionally, just 24% of respondents indicated they have already purchased an Ambulatory EHR/EPM solution, so do not require an upgrade for the same. The third most noted reason for not adopting the solutions was the functionality concerns regarding the software and its integration with their medical practice.

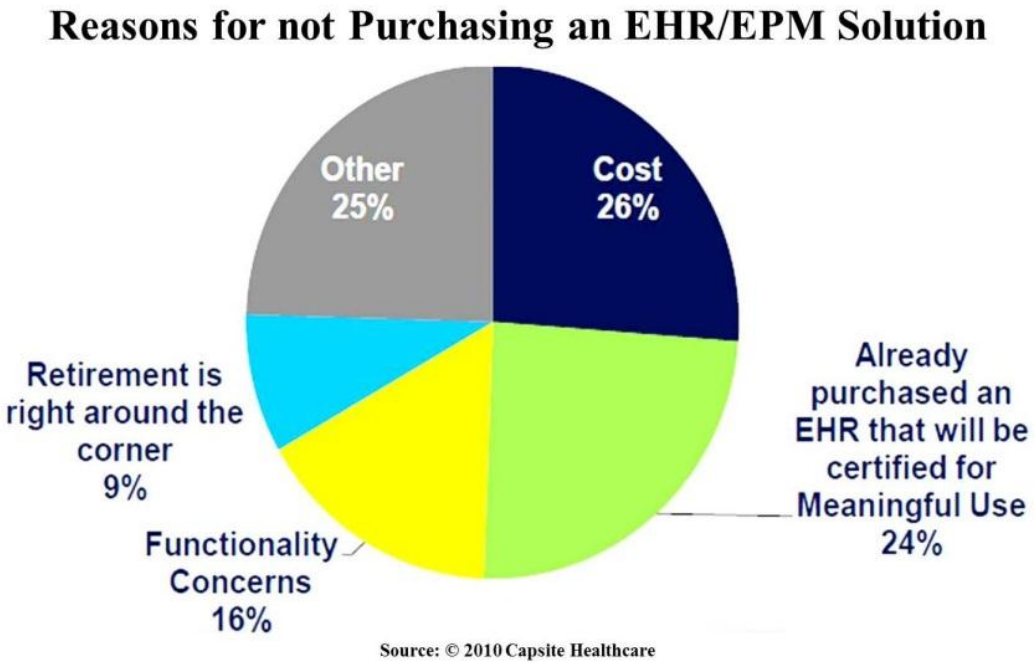
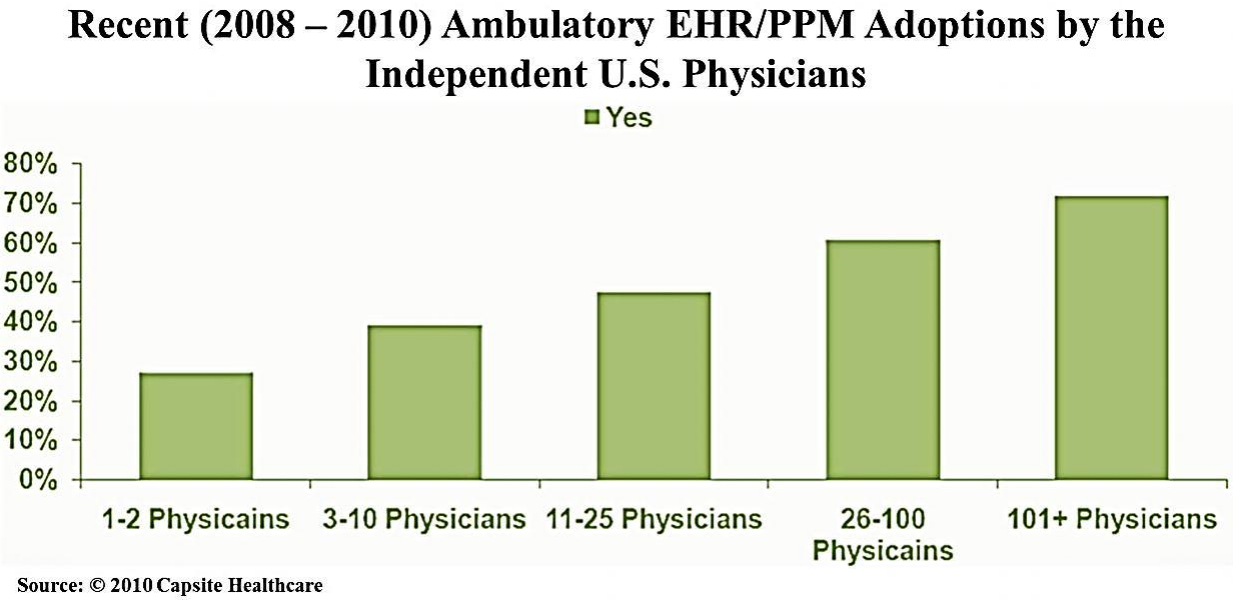


Figure 22. Physician's Reasons for not Purchasing the EHR/PPM Solution

3.3 U.S. PPM Market Landscape

The group of 10 or fewer physician space is the considerable the target market for the growth of PPM adoption in U.S. in the coming months. In addition to this, the following clearly depicts that, there has been an overall increase in the adoption rate of the Ambulatory EHR/PPM solutions. Furthermore, the above stated points could be clearly justified from the following **Figure 23,** which shows that the group of 10 or fewer physicians is where the majority of demand will originate over the next 18 to 24 months.



Source: © 2010 Capsite Healthcare

Figure 23. Adoption of Ambulatory EHR/ PPM Solutions based on the Practice Size

The following **Figure 24** shows a comparative analysis of the recent Ambulatory EHR/EPM purchases for the years 2008 – 2010 based on the independent physicians' market segment thus, indicating that the increase in the percentage of adoption is more in comparison with 2008 and 2009 percentages.

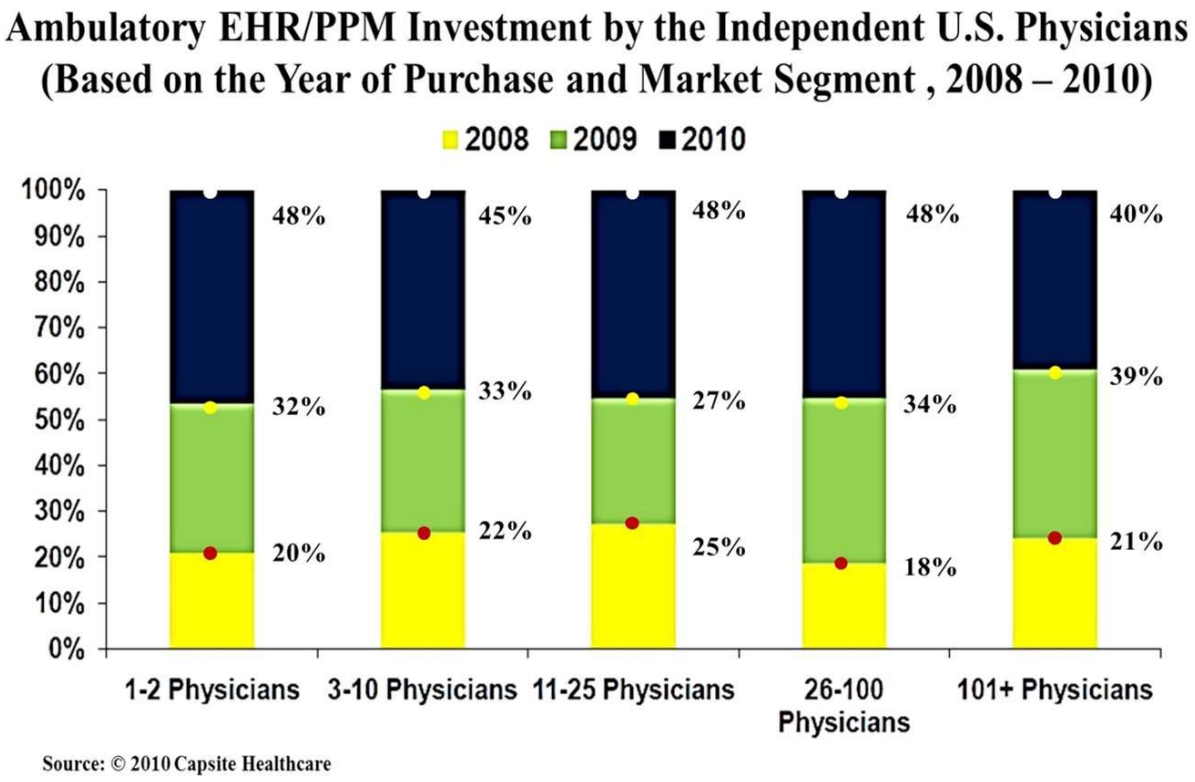


Figure 24. <u>Purchase trends of Ambulatory EHR/PPM Solutions based on the Market Segment</u>

Furthermore, it is clearly observable from the following **Figure 25** that, the investment rates for adopting the Ambulatory EHR/PPM (EPM) solutions have increased steadily each year since the beginning of 2006. It is also found that, quite a number of office – based physician practices have been acquired by hospitals during the last years (NAMCS – 2011). Hence, it is also once one of the major driving forces for the independent physicians for adopting the Ambulatory EHR/PPM solutions to optimize, enhance and secure their medical practices; instead of be acquired by the U.S. hospitals.

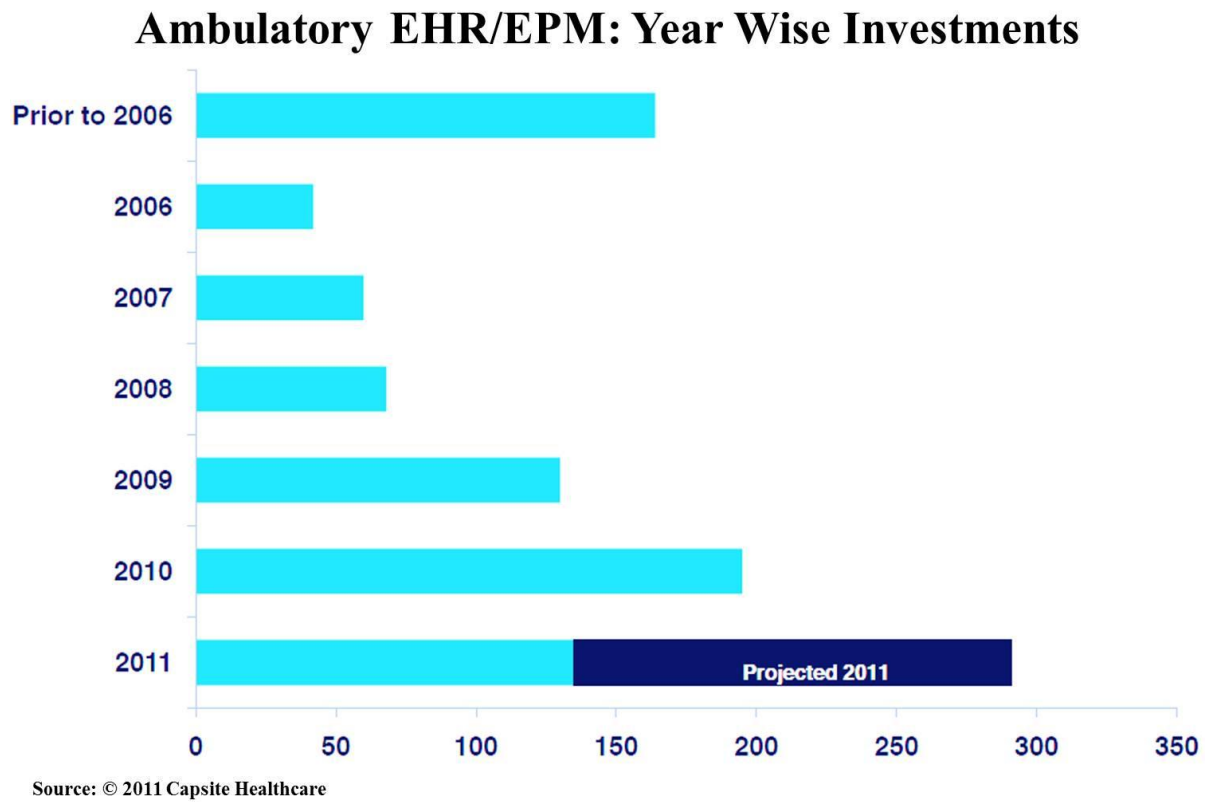


Figure 25. Year Wise Investments for Ambulatory EHR/PPM Solutions

Hence, the above stated figures, clearly depicts that the adoption rates for the EHR/EPM solution is been increasing each and every year. Nevertheless, the MU incentives, demands and expectations of the independent physicians to improvise on their medical practice, for enhancing the patient care and to secure the cost of living and the increased rates of acquisition of the office – based practices by the U.S. hospitals has been the major dynamo for the such an increased rate of adoptions.

3.4 PPM/EPM Vendor Market Share

The Capsite 2010 survey, further highlights that, the physicians are either planning to purchase or replace (or upgrade) their current EHR/PPM solutions. Almost 48% of the physician practices have indicated they have plans to either purchase a new solution or will upgrade their current solution **(Figure 26)**. Hence, this helps in adding a significant amount to the potential market opportunity for vendors with integrated PM and EHR solutions.

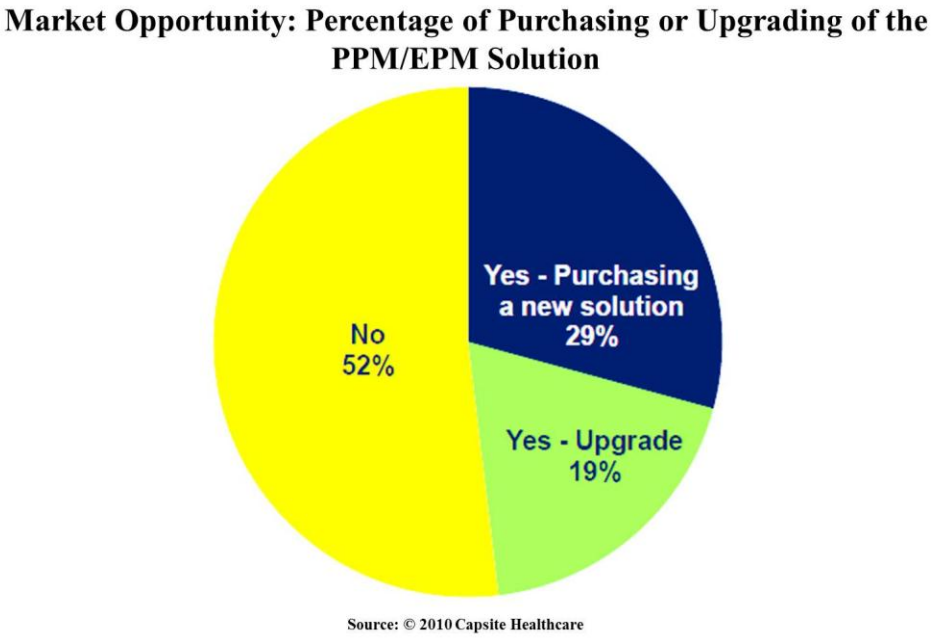


Figure 26. Percentage of Physician's intending to Purchase or Upgrade the PPM/EPM Solutions

Though still the demand for the Ambulatory EHR/PPM has not yet reached a plateau, but still it been reported that the demand can increase the market penetration for the Ambulatory EHR/PPM (EPM) vendors and could reach $3 billion by 2013 (NAMCS – 2011). As easily depicted from the above stated graphs, it can be perceived that the physician sizes of 11 to 25 doctors have a very significant and competitive market for Ambulatory EHR/PPM vendors. Nevertheless, the stimulus funding provided by ARRA, has prompted many ambulatory physicians to decide that now is the right time to invest. In addition to this, the attractive pricing models, strong marketing efforts and post implementation support and services on the part of vendors have further added up as a top up for increased adoption and acceptance of these solutions among the independent American physicians.

In today's growing healthcare market, we can see that there are lots of Physician Practice Management (PPM) solution providers or vendors who are presently functional in the marketplace; they mostly range from those which may be characterized as large, national and even international manufacturers and support organizations, to smaller, niche-oriented, specialized vendors. Some focus primarily on the PPM systems market, some focus primarily on CPR or related systems and, increasingly, some offer total practice management and related business application systems and support to a wide variety of healthcare organizations. Still, the major share of installed PPM systems today are mostly acquired by the leading vendors in healthcare.

In addition to this, the above stated points could be well justified with the following **Figure 27,** which illustrates the top three PPM market share vendors, namely McKesson with 10%, GE with 9% and Allscripts with 9% U.S. healthcare market penetration. All three of the PM market share leaders have completed a number of acquisitions over the years to build out their customer base. Furthermore, the other three primary PPM vendors who are trying to match up with the leaders are Epic, NextGen and eClinicalWorks with 7%, 6% and 4% market penetration.

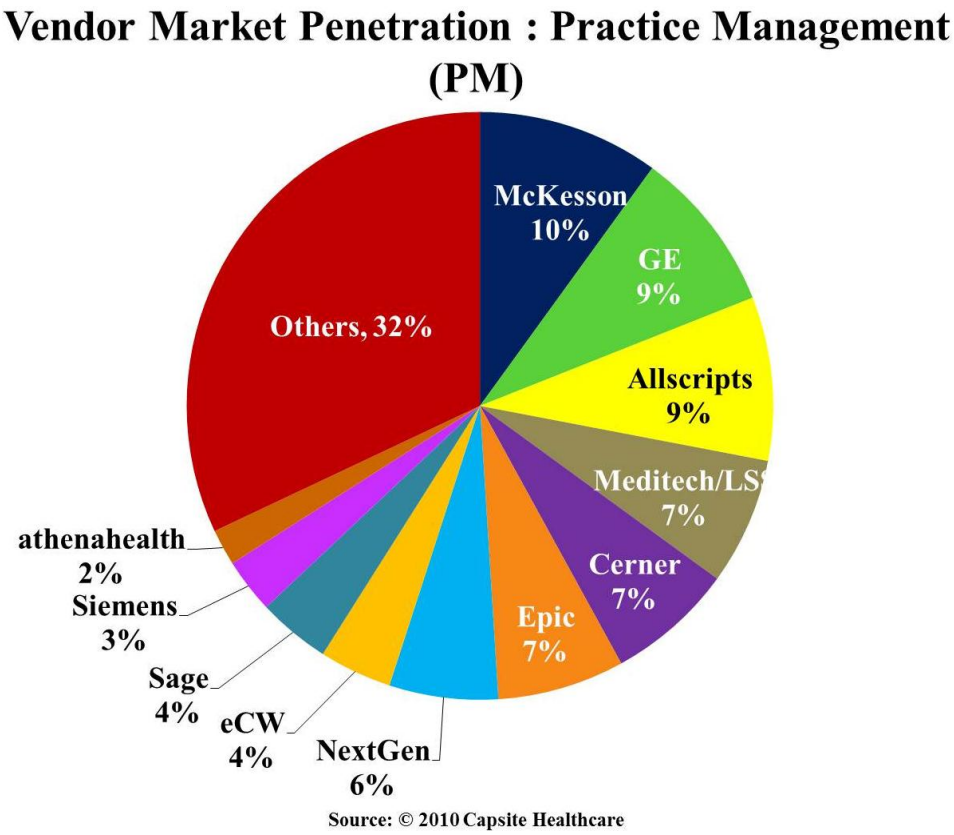


Figure 27. PPM Vendor Market Share

Furthermore, the following **Figure 28** provides a comparative analysis on the current Ambulatory EHR vendor market share by each vendor as compared to the PPM vendor market share. In terms of market share, once again Allscripts, eClinicalWorks (eCW), and NextGen tops for free standing (office – based) practices with the market penetration of 14%, 10% and 8% respectively. The other two primary EHR vendors who are gaining the market share are, Epic and Cerner, with 8% and 6% penetration respectively. Furthermore, the market share for McKesson and Meditech keeps on changing significantly especially when considering only the ambulatory market segment.

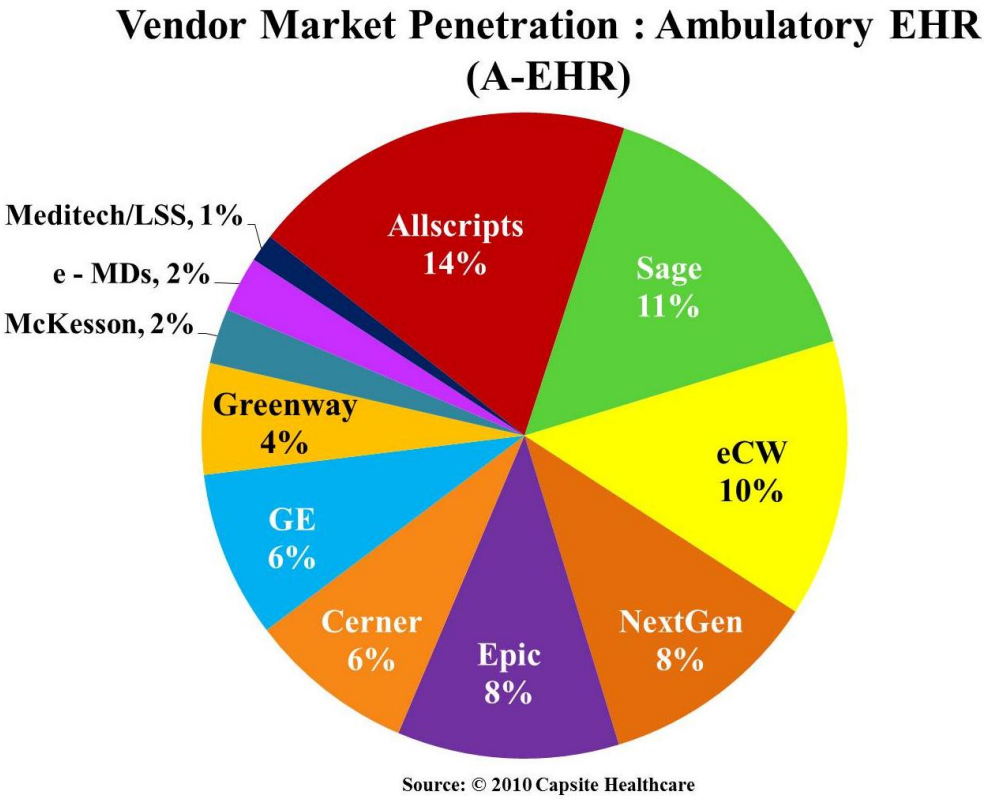


Figure 28. Ambulatory EHR Vendor Market Share

Moreover, it is clearly observable from the previously stated statistics that, the Ambulatory care or freestanding physician practices have been rather slower on the uptake of the Ambulatory EHR solutions. Thus, it is justifiable that the pace in adopting the PPM/EPM solutions for their medical practices will further take some more months to get adopted.

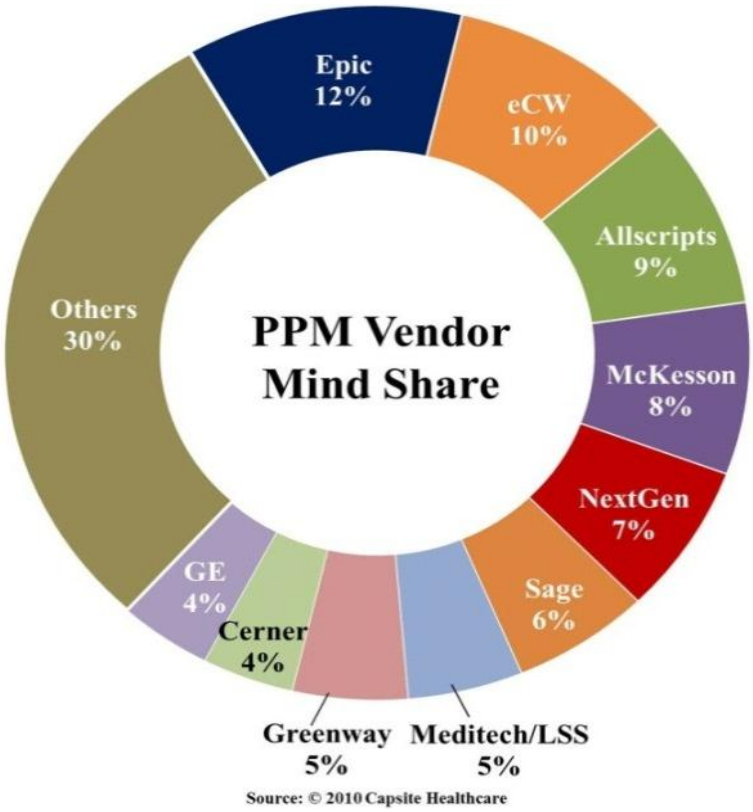


Figure 29. PPM Vendor Market Value/Brand Equity

The market value or the brand equity of any vendor is known its Mind Share of that the respective vendor has in the minds of the people/users. Similarly, the EHR/PPM vendors even have a well-known brand image in the minds of the healthcare professionals and the end users of their solutions. Thus, the above illustrated **Figure 29** depicts the market value or brand image of the PPM Vendors in the healthcare arena for the various healthcare solution providers across the globe.

3.5 Physician Practice Management Vendors: Top Four Market Players

As per the various studies and market analysis of the Ambulatory care environment, it can justified that only a handful of vendors like Allscripts, eClinicalWorks, NextGen, and Athena Health, own more than three-quarters of the Ambulatory EHR software market. But, comparatively have a very lesser penetration in the physician practice management market. Following **Table 1** is the comparative analysis of the top four rated PPM vendors in the healthcare care market.

Comparison Criteria	NextGen	eClinicalWorks (eCW)	Allscripts	Athena Health
Product Name	NextGen EPM	eClinicalWorks PM	Allscripts PM	athenaCollector
Subscription Cost	$599/Month	$400/Month	$750/Month	3% of Practice Collection
Market Share	6%	4%	9%	2%
No. of Providers Served	35,000+	40,000+	40,000+	39,000+ Providers
Revenue (FY 2012)	$429.8 Million	$204.7 Million	$370.0 Million	$422.3 Million

Table 1. Comparative Analysis of Top Four PPM Vendors

Epic, eClinicalWorks, Allscripts, McKesson and NextGen are the top candidates for winning market share away from vendors that currently have high market penetration. Epic and eClinicalWorks have moved up significantly from market share to mind share, while Allscripts has remained consistent across both segments.

	NextGen EMR+PPM Hosted	Athena Health EMR+PPM+RCM Hosted	eClinicalWorks EMR+PPM Hosted	eClinicalWorks EMR+PPM Client/Server	Allscripts EMR+PPM ASP/Hosted	Allscripts EMR+PPM Client/Server
Upfront Cost						
Software						
Application Software	$90,995			$30,000		$41,000*
Third Party Software(1)	$4,697				$141*	$4096*
Estimated Implementation/Training	$56,250	$13,750	$14,225	$14,225	$30,037*	$32416*
Demographics Conversion	$5,000					
Hardware (Client/Server only)						
Estimated Total Upfront (2)	$156,942	$13,750	$14,225	$44,225	$30,178*	$77,512*
Ongoing Maintenance						
Licenses - EMR + PPM	$17,384	$96,940	$33,600	$18,000	$43,500*	$14,000*
Hosting Fee	$16,200		$6,000			
Third Party Software	$1,214				$1100*	$4,424*
Total Annual Maintenance	$34,798	$96,940	$39,600	$18,000	$44,600*	$18,424*
Notes:	5 Years Contract		Implementation $1000/day for 8 - 10 days + travel 9 days(estimated travel expenses)	Implementation $1000/day for 8 - 10 days + travel 9 days(estimated travel expenses)	5 Years Contract	
Total Cost Excluding Hardware						
Total Cost over 2 Years	$226,537	$207,630	$93,425	$80,225	$101,378	$101,761
Total Cost over 5 Years	$330,930	$498,450	$212,225	$134,225	$208,178	$145,393
Total Cost over 10 Years	$504,919	$983,150	$410,225	$224,225	$386,178	$218,113
Amortized Cost/Year						
2 Years Life	$113,269	$103,815	$46,713	$40,113	$50,689	$50,881
5 Years Life	$66,186	$99,690	$42,445	$26,845	$41,636	$29,079
10 Years Life	$50,492	$98,315	$41,023	$22,423	$38,618	$21,811

Source: Whitepaper commissioned by Practice Fusion

Table 2. Product and Implementation costs for the Top Four PPM Solutions

1. NextGen

NextGen Healthcare Information Systems, a wholly-owned subsidiary of Quality Systems, Inc. (NASDAQ: QSII), develops integrated all – in – one electronic health record and practice management systems for assisting the ambulatory care physicians in both clinical as well as the administrative operations.

NextGen solutions and services are designed to function at the forefront of interoperability, data sharing, and integration – both within a single enterprise and across communities. Within the enterprise, NextGen's Enterprise Practice Management (EPM) and Electronic Health Records (EHR) systems work from a single database so information automatically flows between them. Among the listed top four rated vendors, NextGen has the capabilities of being easily integrated with any third party software's, has the best user interface which is more intuitive and easy to use.

Moreover, as reported by the market analysis, the NextGen products are found to be more scalable to any practice size and can be customized to meet unique workflow and content needs of both physicians and office staff. Some of the features of NextGen EPM are:

- Appointments Scheduling and eligibility check
- Denial Management.
- Collections Management
- Auto-Worker, for tasks like small balance write-offs and reclassification of A/R, etc.

2. eClinicalWorks

eClinicalWorks is a privately-held, leader in ambulatory care solutions. Its technology extends the use of electronic health records beyond practice walls and creates community-wide records. eClinicalWorks provides more than just a way for your practice to go paperless. This comprehensive solution is the next-generation for healthcare IT, allowing practices to improve efficiency and enhance patient care. Using the eClinicalWorks PM solution, will help the physicians' practices to achieve its goal of delivering the best patient care for any kind of practice enterprise. The PM system provided by eClinicalWorks, helps in managing the appointments and schedules, streamlines medical billing, and stores important demographic data.

The eClinicalWorks offers a comprehensive EHR solution, so Practice Management works in concert with the entire eClinicalWorks line. It is just one part of an inclusive product, combining an EMR, PM, community health exchange, reporting system, mobile system, patient messaging system and patient Web portal. Some of the eClinicalWorks PM features available are:

- Schedule management
- Patient Demographics
- Medical Billing Management
- Claims Scrubbing
- Reporting

3. Allscripts

Allscripts Healthcare Solutions is a publicly traded American company that provides the healthcare enterprises with comprehensive healthcare solutions that coordinate care, engage patients and leverage robust analytics. Ultimately, the solutions provided, helps in improving the clinical and financial outcomes. Moreover, Allscripts provides solutions that help physician practices ensure complete documentation to improve outcomes and optimize reimbursements.

The Allscripts PM helps in introducing effective and efficient workflows to a medical practice to generate more money and achieve a healthier bottom line. A unique rules-based engine closely aligns staff preferences with industry best practices using optimal workflow automation and the result is a powerfully connected and productive front and back office. From scheduling all the way through collections and management reporting, all depends on Allscripts PM for the high-performance practice needs and to produce exceptional outcomes for their business and for the patients. Thus, it is a unique way of integrating the business/administrative and clinical aspects of the medical practice. Some of the features provided by Allscripts PM are:

- Single-screen Executive Dashboard for accessing patient information
- Scheduling & Registration / Check-in
- Workflow Automation to Staff Preferences
- Claims Management, Charge Entry & Collections
- Drill-down Management Reporting

- Data Security, Compliance & Technical Support

4. Athena Health

Athena Health is a publicly traded American company that provides physicians and other healthcare enterprises with the integrated solution that makes patient processing and practice workflows more efficient and provides complete visibility into their practice.

The athenaCollector is a cloud-based physician billing and practice management solution that reduces the administrative glitches and allows the physicians to efficiently assess, plan, and improve their practice performance while increasing revenue.

The athenaCollector is easy to use, saves time, and gets the medical practice more money and more control of the practice functionalities. Some of its features are:

- Appointments Scheduling and eligibility check
- Patient Registration
- Claims Management, Charge Entry & Collections
- Reporting and Analysis

3.6 PPM/EPM Vendor Market Opportunity

The Opportunities in the PPM services market are not restricted only to those services providers that have already firmly entrenched themselves in the physician's office and group practices segments. Since many of today's PPM vendors are small, niche or smaller divisions of large healthcare conglomerates and might not have their own services capabilities, but their customers still want total customer support. For this reason, it often takes a partnership to support the customer base with everything they will require. Moreover, the following figures illustrated the prospective market and the target customers for the PPM vendors in the coming months.

The following **Figure 30** aids in analyzing the PPM vendors' market opportunity in the coming months; as almost more than 50% of the survey respondents based on their practice size, replied in favor of either purchasing or upgrading their existing PPM solution.

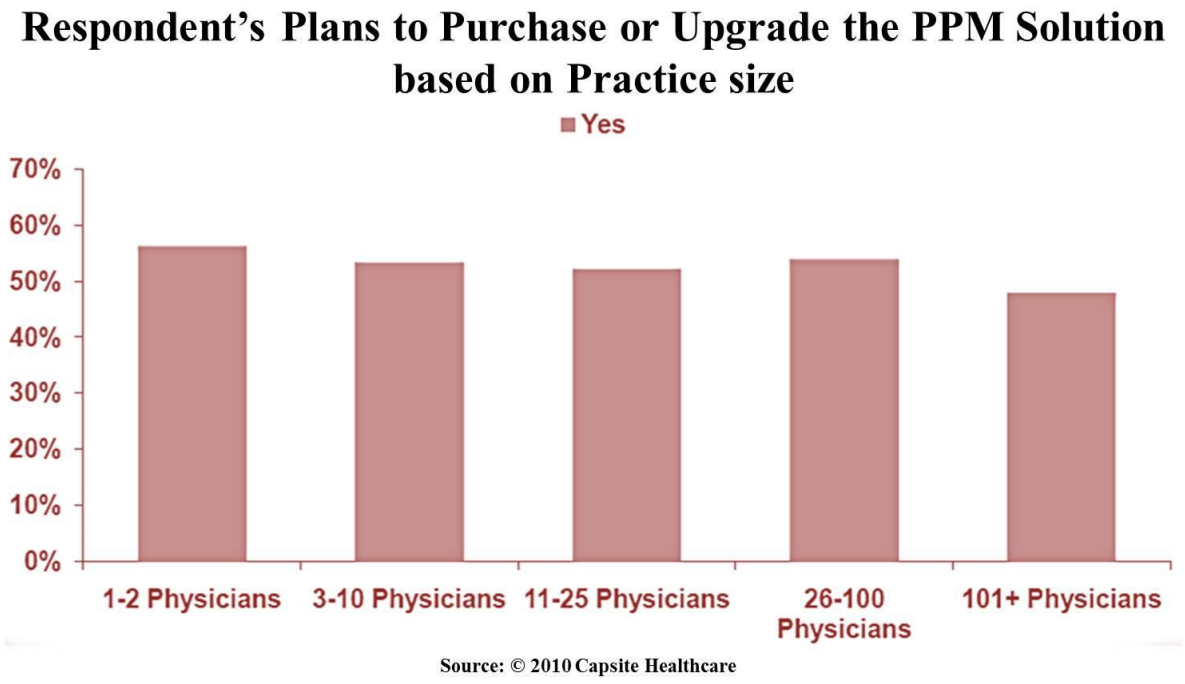


Figure 30. Physician's plans to Purchase/Upgrade the PPM Solutions (Based on the Practice Type)

Additionally, there is also an increasing trend of replacing the current PPM solutions for an integrated PPM and EHR solutions. The following **Figure 31** clearly illustrates that, almost 63% of the respondents indicted to replace their current PPM solution for an integrated solution. These figures have increased steadily over the last three years from 46%; suggesting that an increasing number of physician groups are in search for vendors who can provide them with an integrated EHR/PPM solution.

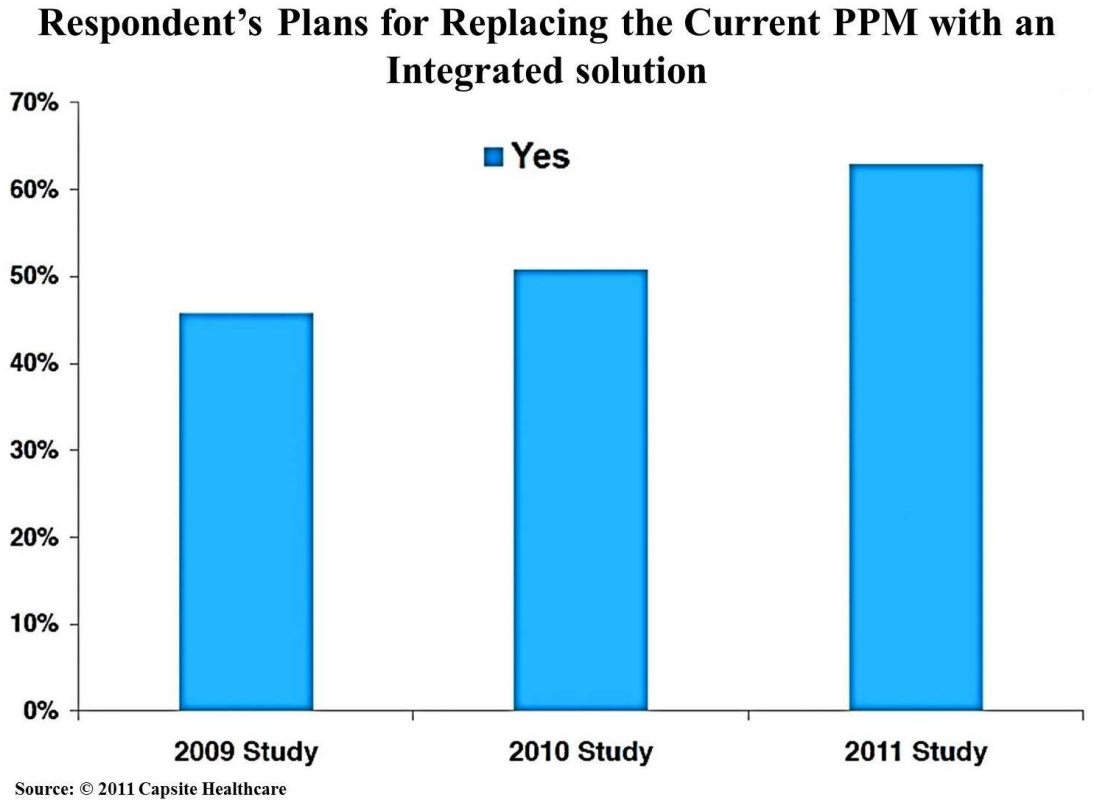


Figure 31. Physician's plans to replace the current PPM Solutions with an integrated solution

Moreover, as stated by the senior vice president and general manager of Capsite Healthcare Consultancy, that the demand for EHR and PM solutions has continued to accelerate and is on track to nearly double in the volume of purchasing activity that was measured in 2010. Thus, it shows that the demand for physician practice management systems and electronic health record, is relatively stronger among certain physician groups, and is expected to remain so over the next 12 to 24 months **(Figure 32)**. Also, in order to achieve the meaningful incentives in the specified timeframe, almost more than half of the independent physician practices are looking to purchase a new or upgrade their existing PPM solution much sooner (i.e., within 12 months or so) than just purchasing an Ambulatory EHR solution.

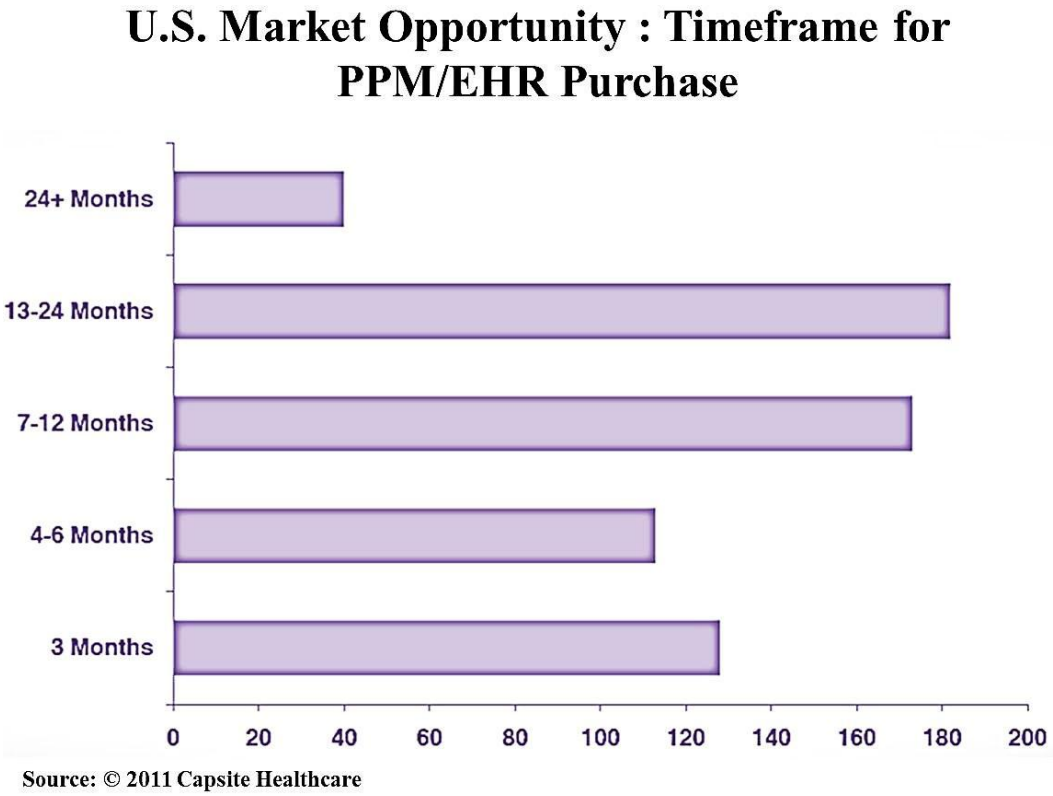


Figure 32. Timeframe for EHR/PPM Purchase

In addition to the above said, it is found that almost 51% of group of physicians plan to purchase an Ambulatory EHR/PPM solution, as compared to the 36% in the previous year (2009). Furthermore, it can be estimated that there are just over 300K independent physicians currently without an EHR or PPM solution.

As shown in the **Table 3**, the adoption levels and plans to purchase a new Ambulatory EHR/PPM or EPM solution varies according to physician size, with the largest opportunity within the 1 to 2 and 3 to 10 physician practices. Also, there has been an increase in the average physician spend from $15K to $19K **(Table 4)**, in order to account for physicians who will either purchase a new or replace an existing Practice Management solution.

Physician Practice Size	Total No. of Physicians	Physicians with New EHR/PPM	Physicians without EHR/PPM	No. of Physicians without EHR/PPM
1-2 Physicians	107,476	27%	73%	78,457
3-10 Physicians	248,887	39%	61%	151,821
11-25 Physicians	92,542	47%	53%	49,047
26-100 Physicians	48,835	60%	40%	19,534
101+ Physicians	11,540	72%	28%	3,231
Total	509,280			302,091

Source: Number of physicians from SK&A as of 02/09/10

Table 3 Illustrating the Number of Physician's without an EHR/PPM Solution

Physician Practice Size	% of Physicians Plan to Purchase	No. of Physicians Plan to Purchase	Average Physician Spend	Total Market Opportunity
1-2 Physicians	55%	43,152	$19,000	$819M
3-10 Physicians	64%	97,165	$19,000	$1.8B
11-25 Physicians	40%	19,619	$19,000	$372M
26-100 Physicians	41%	8,009	$19,000	$152M
101+ Physicians	42%	1,357	$19,000	$25M
Total		169,302		$3.2B

Source: Number of physicians from SK&A as of 02/09/10

Table 4 Illustrating the total Market Opportunity for the EHR/PPM Vendors

Thus, as a conclusion to the overall analysis, we can say that the top four reasons for making the PPM/EHR purchases are quality, efficiency, office acquisitions and ARRA-HITECH stimulus funding. In addition to this, the replacement cycle or purchase of an integrated PPM/EHR solution also has a great market opportunity particularly for the practice sizes of 11 – 25 Physicians. Nevertheless, the practice sizes of fewer than 10 physicians is a very competitive market for the PPM/EHR vendors as, they form the major customers for purchasing a PPM/EPM solution within 12 – 24 months. Hence, these factors, brings the total market opportunity to $3.2 billion for 2013, which is expected to increase with the growing demand for better and efficient ambulatory and care solutions in the coming years.

CHAPTER 4.

DISCUSSION

4.1 Business Opportunities for the Healthcare Service Organizations

The PPM/EPM vendors entering into strategic partnerships with healthcare services organizations to improvise on their current market share and have better market opportunity in the coming few months. Moreover, it is expected by the PPM vendors that the these services organizations have in place the necessary infrastructure, expertise, staffing and geographic capabilities to provide users with nationwide on-site field support as well as assistance via telephone help desks/hotlines and, increasingly, self-help via the Internet (offshore support).

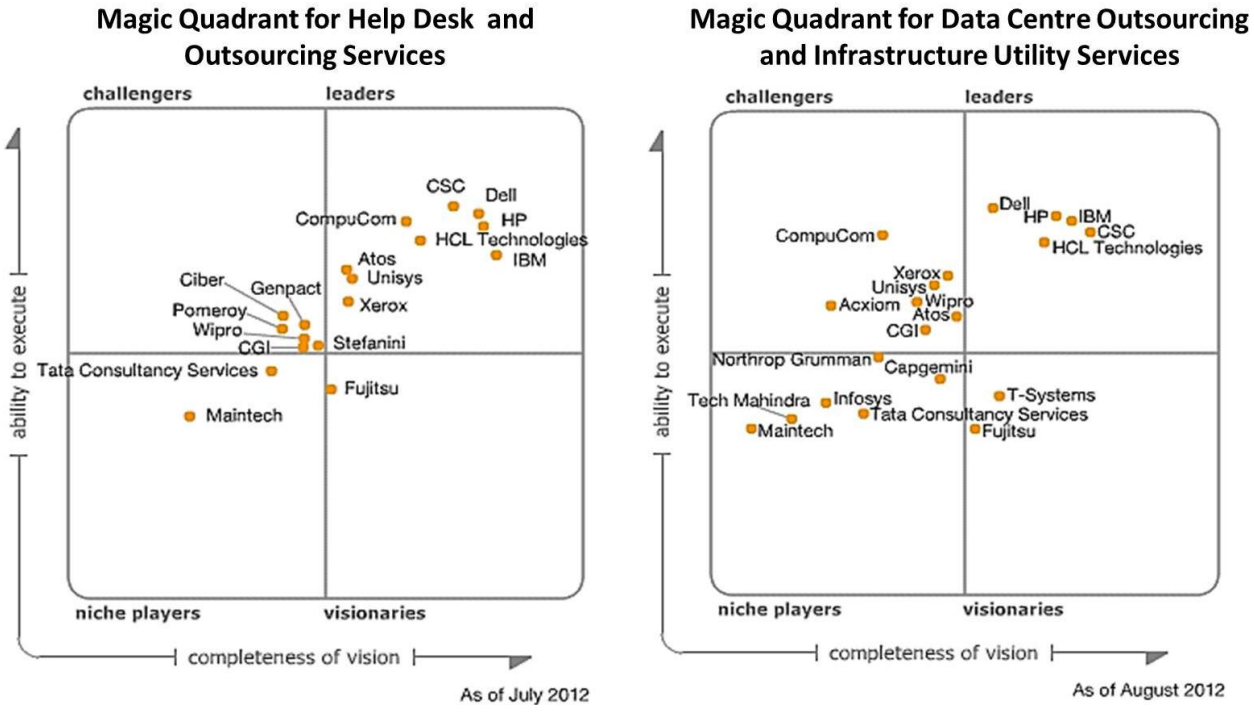


Figure 33. Gartner's Magic Quadrant

Some of the reasons for such partnerships are:

- Insufficient capabilities to provide service and support to the customer directly
- Lack of domain experience and expertise

- Total enterprise support including the integration with other Healthcare IT solutions
- Cost

4.2 Fostering Drivers for Dell Services

Dell has been a leader in providing support and services to all it customers and vendors. Though, Dell to some extent has always remained involved in the ongoing healthcare technological advancements, but just at the bottom line of the services rendered. However, considering the case for the PPM service and support market, we can say it is somewhat wide as not all of the leading PPM product vendors have the capability to directly service and support their complete product lines. Especially in cases where the PPM systems are integrated with third party software, because the ability for a single systems vendor to provide total enterprise support becomes even more difficult and complex.

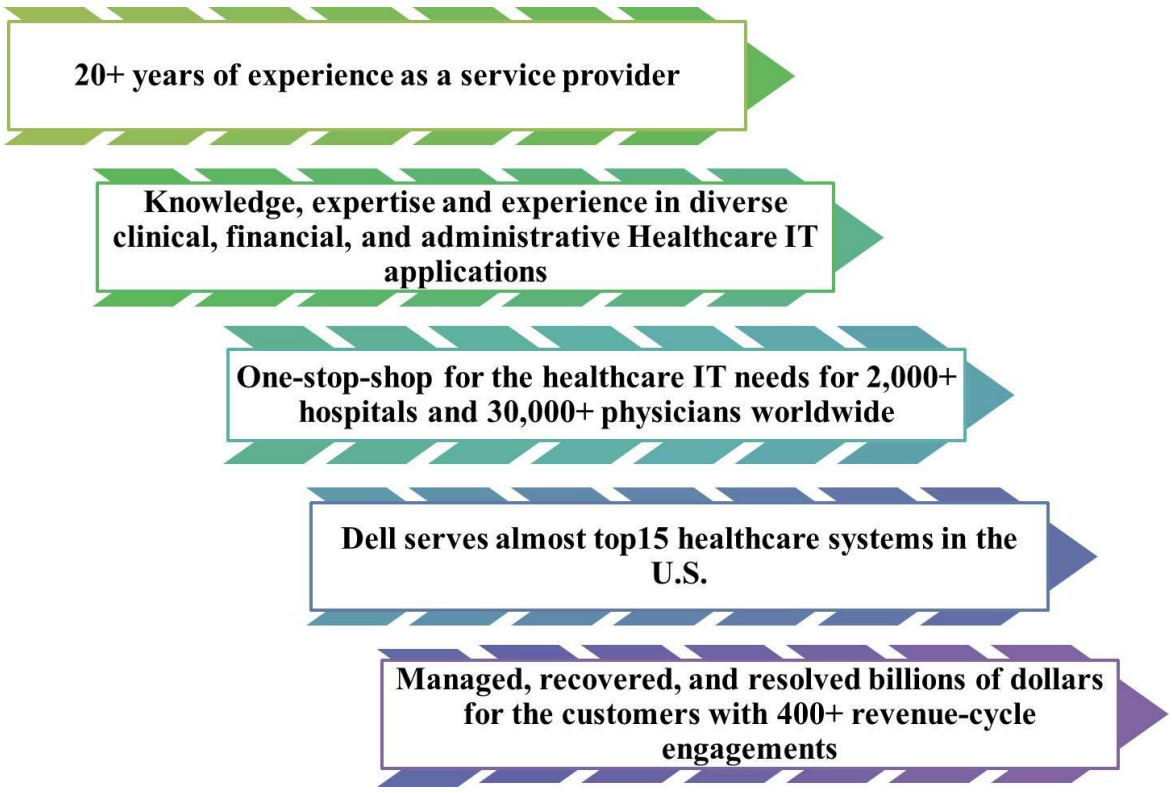


Figure 34. Some of the accomplishments of Dell Services

Therefore, due to this reason, many of the PPM systems vendors have entered into strategic partnerships and arrangements with reputable services organizations that both understand the medical/healthcare markets in which these systems are being used - particularly the group practice and physician's office segments - as well as having the experience and expertise required to support the specific types of equipment upon which these systems operate.

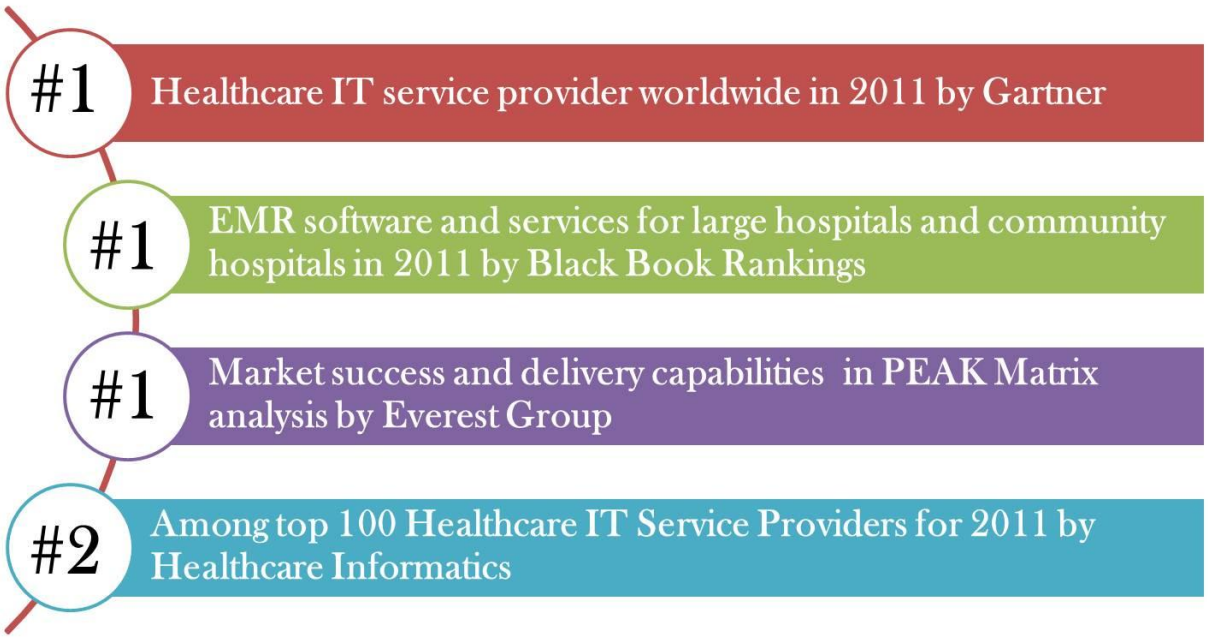


Figure 35. Dell's Ranking (2011)

Thus, with the increasing number of vendors by the day, EMR and Practice Management technology is rapidly evolving – with specialty specific EMR systems now making their presence felt. Healthcare professionals are no longer satisfied with basic EMR functionality and thus look for a solution that caters to their specialty specific clinical content and workflows. As the care continuum strives for improved clinical outcomes, it would require a great deal of effort from vendors and providers to build up the strategic partnerships with the services provider organizations.

Hence, Dell Services being the No. 1 leader for rendering the Healthcare IT support and services to its customers can find this as wide opened opportunity to dive in and become the champion of all.

4.3 Physicians Practice Management Support Areas

The following section provides an outline of support services that can be rendered by a healthcare service organization in order to support a PPM application vendor. The support services listed below are analyzed considering the basic functionalities and features rendered by the top for ranking PPM vendors and even the end users of the system.

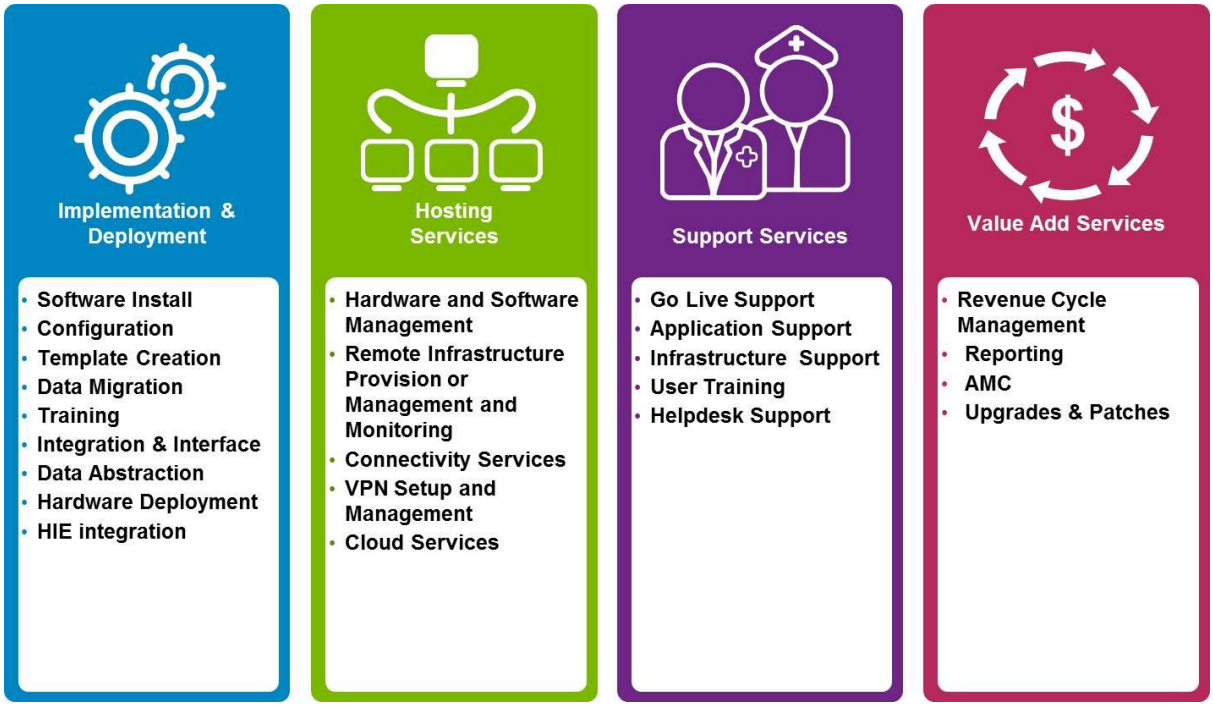


Figure 36. PPM Support Areas

4.4 Challenges and Barriers for the Healthcare Service Organizations

- Recruitment of trained resources or SME's
- Streamlining of processes, elimination of duplications and integration issues
- System Documentation and Reporting
- Validating the Requirement, hardware and software analysis
- Abiding with the set deadlines for enhanced customer satisfaction
- High volume paper correspondence, proper data abstraction and conversion
- Licensure, accreditation and certification considerations
- Data Storage and Security concerns
- Disaster Prevention and Recovery concerns

CHAPTER 5.

CONCLUSION AND RECOMMENDATIONS

The American physician practices are on the brink of a new era, one of which is the practice management (PM) solutions that are becoming a reality day by day. The timing of when to adopt or replace a PPM solution is not the same for every practice, and likewise the choice of which PPM solution to choose is not universal. Successful implementation requires months of careful planning and analysis of the practice. It is likely to require several more months to reach the efficient and meaningful use of the PPM and EHR solutions.

- **Advantages of PPM Solutions**

  - Improved cash flow with faster and more accurate billing
  - Responsive customer-oriented support
  - Virtual Access to the worldwide network of healthcare organization
  - Improved data security and access
  - Improved workflow and more effective use of the practice staff
  - Improved tracking of collections, possible through timely notices and follow-up details
  - Eliminate many of the routine operating expenses in your practice:
  - Charts and reports for making forecasting, auditing, profit analysis and practice optimizing easier
  - Helps in reducing the business/practice waste and increases profits
  - Pre-built clinical templates and workflows for ensuring complete and accurate documentation stored in a standard format
  - Disease management templates capture discrete data at the point of care to meet clinical reporting guidelines for pay-for-performance programs

The implementation of physician practice management solutions has the potential to reduce physician practice expenses and improve quality of care by enhancing the practice functionalities. The current EMR designs are heavily driven by billing and documentation needs, rather than by patient and provider needs around clinical management. Moreover, the

lack of payment incentives and insufficient operational processes for coordination complicate the challenges clinicians face in using current Ambulatory solutions. The collaborative decision making still remains difficult without an apt solution for the outpatient care clinics. The PPM solutions itself continues to evolve, and much of its potential has yet to be realized. The recently-begun process of certification of the healthcare solutions has helped in providing an assurance of existing PPM solutions and their vendors. Moreover, the passage of HITECH Act legislation in February 2009 has added a significant new set of considerations to the process of EMR/PPM selection, to advance the use of technology in healthcare and to encourage the physicians to adopt the Ambulatory solutions before the end of 2015.

- **Disadvantages of PPM Solutions**

  - Integration issues between a third party EHR and PPM solution
  - Security concerns for the patient's health information
  - Network connectivity issues between the interfacing components

Despite of some disadvantages of the PPM solution, it can be easily predicted by analyzing the secondary sources that in order to take full advantage of the financial incentives, the healthcare providers need to take more rapid steps towards a comprehensive, interoperable PPM/EPM system over the next few years. While considering the cost factor for adopting an ambulatory solution, the only investment cost related to it is the hardware, software and the lost revenue for the time spent in learning a new system and training office staff on its use. Comparatively, the two major benefits attached to the implementation of the PPM/EPM solutions. First, the physicians have the opportunity to receive a greater amount in incentives if the process starts at the earliest. Second and the most important factor is that, the physicians will be implementing a system that will aid in enhancing the efficiencies of their medical practice, the overall healthcare system and the ability to administer care for their patients. Ultimately, in the long run, the adoption of Ambulatory solution in the office based clinics will lead to improved medical care for the community.

CASE STUDY

CHAPTER 6.

QUANTITATIVE CASE STUDY

"Analysis of Stress Levels and the Use of Information Technology among the IT Professionals of Bangalore"

The following case study is based on the analysis of the occupational stress levels and the use of Information Technology to overcome its consequences by the IT Professionals of Bangalore.

The primary objectives of the study are:

1. To analyze the prevalence of occupational stress among the IT Professionals of Bangalore
2. To study the relationship between the demographic characteristics (Gender, Age and Work Experience) and the level of occupational stress among the IT Professionals
3. To analyze and determine the possibility of using Information Technology to reduce the levels of stress

6.1 Introduction and Problem Statement

The information technology (IT) service industries in India have become highly visible nodes of the global economy, attracting substantial attention from international media and business interests as a prime destination for outsourcing and off-shoring. Moreover, in the present work environment, the group of IT Professionals is considered as one of the fastest growing workforces.

Additionally, the work in this industry is distinctive as it is not only catering to the global market, but is often performing virtually. Thus, giving rise to new kinds of workplaces, work cultures, and employment issues. The rise of the IT industry has also fed into ongoing processes of globalization, stimulating significant transformations in the urban middle classes and in the cultural milieu of cities such as Bangalore. These include changes in lifestyles,

forms of sociality, family structure, and self-identity, which are linked to the rapid upward socio-economic development.

But on the other hand, despite of many advantages, the nature of job in IT industry has a negative impact on the employees' physical and mental health. IT work tends to be high-pressure and the workflow is regulated by the tyranny of deadlines and project timelines. The IT profession has sprouted suicides, divorces, cardiac ailments, and depression, apparently more than its proportionate share. Along with the access to international travel and the ability to mingle with people of different cultures has also arrived the deep isolation of late hours, no social life outside of immediate family, no hobbies, and few and brief vacations. There is also the loss of job security; employees have to perform and deliver on projects on time to retain their hold on jobs; they also have to refresh their skills constantly, often under pressure of an immediate project deadline.

There is no question that stress on IT people has increased in the last few years. The increased stress is due to the fact that IT people are more integral part of the overall business and like other business people, feel the pressures of quick product cycles, major changes in organization structure, and decreased downtime (Rubin Robert, 1998). The IT profession is indeed a stressful profession. IT professionals have to cope with long working hours, unending user demands, unmet deadlines and skill obsolescence. If IT professionals face tremendous job stress which cannot be contained, burnout will happen in them and this will lead to a variety of health problems (Liang, 1997). There is clearly a need for organizations and IT professionals to pay attention to and manage the occupational stress of IT professionals. Organizations that fail to do so are likely to have dissatisfied employees and high staff turnover. IT professionals who fail to effectively manage their stress may end up with a variety of health problems.

Hence, the nature/pattern of work, target achievements, night shifts, over work load, etc. are largely responsible for the high levels of stress among the IT professionals. Thus, the present study focuses on the levels of job stress and the use of Information Technology among the IT professionals.

6.2 Review of Literature

King, J., (1995). Stress among information system (IS) professionals is long recognized as a key factor affecting IS productivity and turnover and leading to substantial associated costs. It is estimated that, on average, IS employees work 50 hours per week; almost half work an average of six hours on Saturdays and Sundays; and about 70% have worked while sick

Balasubramanian Vimala and Chokalingam Madhavi (2009) The mean values shows that the overall stress is high among employees in the group aged more than 25 years with a mean value of 110.81. Analysis of the overall stress level finds that overall stress is high among employees with more than five years of experience with a mean value of 89.60 and low among employees with less than four years of experience with a mean value of 81.34.

Mohsin Aziz, (2004).The research finds differences in the level of stress between married and unmarried employees on several role stressors. However, level of education does not emerge as a significant differentiator of stressors.

Rajib Lochan Dhar and Manju Bhagat (2008). The study found that the participants accepted that they experienced quiet an amount of stress due to their nature of work, although the level of stress observed, varied amongst the participants. Many of the stressors, identified by the participants, seemed to be typically associated with the nature and type of their work. Stress was mainly associated due to the interaction of the person factors with works environment factors. This study highlights the importance of work place social support provided by the superiors and colleagues in order to reduce stress and developing a healthy work environment.

Zaki Rashidi and Amanat Ali Jalbani (2009). A higher degree of stress is found in unmarried people as compared to married people on the average. The average, the age groups 25–28 years are reporting the highest stress. The analysis according to various degrees and qualification shows that almost all types of qualifications are experiencing equal stress. Hence, the educational qualification does not create any significant impact on the job stress. Those people who are working both as technical and managerial support in the software

houses are experiencing more stress, and showed the higher causes of stress as fear of obsolescence, client interaction, and workload.

6.3 Understanding the Occupational Stress and Its Impact

Occupational stress has been a serious matter for employees, organizations and communities. The problems associated with occupational stress are immense, and their effect on health and well-being is on the increase. The occupational stress is considered to be one of the primary work-related health problems, mainly in the developing countries.

Occupational stress -also called work stress, job stress or stress in organizations- "is a condition wherein job-related factors interact with the worker to change, either disrupt or enhance, his or her psychological or physiological conditions such that the individual's mind and/or body are forced to deviate from normal functioning." Occupational stress symptoms are not left in the workplace at the end of the workday, but remain with the human being to impact on to the broader psychosocial domain.

While there is little consensus among psychologists about the exact definition of stress, it is agreed that stress results when demands placed on an organism cause unusual physical, psychological, or emotional responses. In humans, stress originates from a multitude of sources and causes a wide variety of responses, both positive and negative. Despite its negative connotation, many experts believe some level of stress is essential for well-being and mental health.

Stress results from a mismatch between the demands and pressures on the person, on the one hand, and their knowledge and abilities, on the other. It challenges their ability to cope with work. This includes not only situations where the pressures of work exceed the worker's ability to cope but also where the worker's knowledge and abilities are not sufficiently utilized and that is a problem for them.

A healthy job is likely to be one where the pressures on employees are appropriate in relation to their abilities and resources, to the amount of control they have over their work, and to the support they receive from people who matter to them. A healthy working environment is one in which there is not only an absence of harmful conditions but an abundance of health

promoting ones. These may include continuous assessment of risks to health, the provision of appropriate information and training on health issues and the availability of health promoting organizational support practices and structures. A healthy work environment is one in which staff have made health and health promotion a priority and part of their working lives.

6.3.1. Major Sources of Stress (Stressors)

Most of the causes of work stress are concerned with the excessive and otherwise unmanageable demands and pressures caused by poor work design, poor management and unsatisfactory working conditions. The various sources of occupational stress could be categorized in nine aspects these are as shown in the **Figure 37.**

Figure 37. Major Sources of Occupational Stress (Stressors)

6.3.2. Effect of Work Stress

a. On Individuals: The experience of work stress can cause unusual and dysfunctional behavior at work and contribute to poor physical and mental health. At the same time, they may engage in unhealthy activities, such as smoking drinking and abusing drugs. Some the effects of stress on individuals are:

- Become increasingly distressed and irritable
- Become unable to relax or concentrate
- Have difficulty thinking logically and making decisions
- Feel tired, depressed, anxious
- Have difficulty sleeping
- Engaging into practices like smoking and drinking
- Experience serious physical problems, such as:
  - Heart disease,
  - Disorders of the digestive system,
  - Increases in blood pressure, headaches,
  - Muscular-skeletal disorders (such as low back pain and upper limb disorders)

b. On Organizations/Employers: Work stress may also challenge the healthiness and performance of the IT organizations. It would affect not only their performance in the increasingly competitive market but eventually even their survival. These could be in form of:

- Increasing absenteeism
- Decreasing commitment to work
- Increasing staff turn-over
- Impairing performance and productivity
- Increasing unsafe working practices and accident rates
- Increasing complaints from clients and customers
- Adversely affecting staff recruitment
- Increasing liability to legal claims and actions by stressed workers
- Damaging the organization's image both among its workers and externally

6.4 Methodology

For the study a survey was conducted were the data was systematically recorded from the respondents. A structured questionnaire comprising of 25 questions was prepared to get the relevant information from the respondents.

The questionnaire consists of a variety of questions presented to the respondents for their response. The various types of questions used in this survey covered the *basic demographic details, job related information, stress related analysis questions and the basic health seeking information possibly using the internet.* (Annexure). Most of the questions were multiple choice and closed ended along with a few open ended questions. SPSS 16.0 is used for the analysis of the data collected for the case study. The study was conducted in Bangalore with a total number of 50 respondents from different areas associated with various well known IT organizations of Bangalore. The respondents were selected by using convenience sampling based on their availability and willingness to respond for the study conducted.

6.4.1 Research Question and Hypothesis of the Study

Research Question (RQ): Analyzing the prevalence of Occupational Stress among the IT professionals of Bangalore, its relationship with the Demographic Variable and the Use Information Technology for Stress Management?

$H_1$0: There is no significant relationship between gender and the level of occupational stress

$H_2$0: There is no significant relationship between Age of the Respondent's and the level of occupational stress

$H_3$0: There is no significant relationship between the Work Experience and the level of occupational stress

$H_4$0: There is no significant relationship between the Marital Status and the level of occupational stress

$H_5$0: The use of Information Technology can be helpful in managing the levels of stress

6.5 Results and Findings

The following analysis is concluded after the data collection by using SPSS 16.0.

- **Number of Respondents**: 50
- **Respondents Covered:** IT Professionals of Bangalore
- **Work Profile:** IT Professionals catering to various IT related occupation in well – known IT Organizations of Bangalore, Karnataka

Table No. 5 Respondent's Demographic Details

	Variables	Frequency/Count	Percentage
N = 50	**Age**		
	>=25 Years	10	20.0
	26-35 Years	32	64.0
	36-45 Years	8	16.0
	Gender		
	Male	28	56.0
	Female	22	44.0
	Marital Status		
	Married	21	42.0
	Unmarried	25	50.0
	Divorcee	4	8.0
	Work Experience		
	0-5 Years	14	28.0
	5-10 Years	24	48.0
	10-15 Years	8	16.0
	>15 Years	4	8.0
	Total	50	100.0

The study is based on a survey conducted for the Information Technology professionals working in and around Bangalore with sample size of 50. Out of total sample, 56% of the respondents were men and rest (44%) was women. The respondents were IT professionals with 64% of the respondents between 26 – 35 years representing the major sample of the

survey. Moreover, around 42% of the survey respondents were married, 50% were unmarried and about 8% were divorcee. Also, the majority of the respondents i.e., almost 48% were having experience of 5 – 10 years in the IT sector.

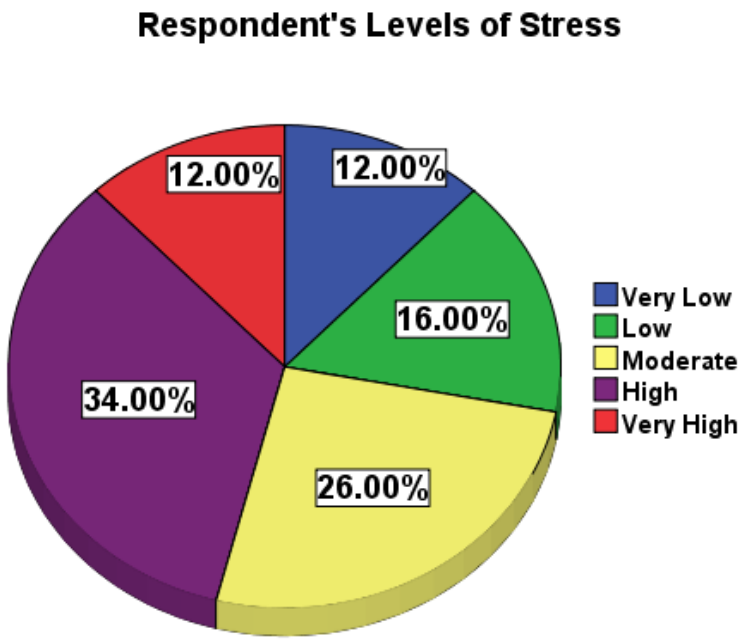


Figure 38. Levels of Stress experienced by the Survey Respondents

As per the survey results, it is found that 46% of the respondents are suffering from severe levels of occupational stress with only 26% suffering from moderate levels of stress. In addition to this, around 72% and 96% of the respondents have reported severe Headache and Backache problems respectively.

Furthermore, the correlational analysis was done for the research hypothesis. The results of the hypothesis are as follows:

Table No. 6. Results of Research Hypothesis				
Hypothesis	**Pearson Correlation**	**Sig. (2 – Tailed)**	**Result**	
$H0_1$ (Gender)	0.069	0.635	Null Hypothesis Rejected	**N = 50**
$H0_2$ (Age)	-0.240	0.616	Null Hypothesis Rejected	
$H0_3$ (Work Experience)	-0.195	0.047	Null Hypothesis Accepted	
$H0_4$ (Marital Status)	-0.52	0.718	Null Hypothesis Rejected	
$H0_5$ (Use of IT for Stress Management)	0.390	0.13	Null Hypothesis Accepted	

A. Hypothesis 1: There is no significant relationship between gender and the level of occupational stress

It could be analyzed from the result that there is linear relationship between Respondent's Gender and the Levels of Occupational Stress. **Hence, Hypothesis H_10 is accepted.**

Moreover, it can be depicted from the following **Figure 39** that the stress levels are higher in males as compared to the females.

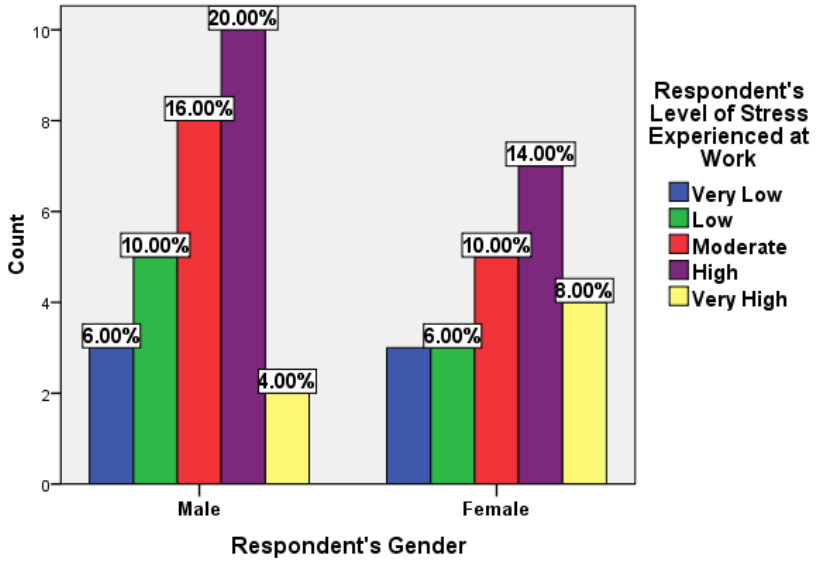


Figure 39. Levels of Stress based on the Respondent's Gender

B. Hypothesis 2: There is no significant relationship between Age of the Respondent's and the level of occupational stress

The results show that there is linear relationship between the Age of the Respondent's and the level occupational stress. **Hence, Null Hypothesis (H_20) is rejected.**

In addition to this, the following **Figure 40** clearly depicts that the levels of stress is more common in the age group of 25 to 35 years of age due to several stressor like job security, career growth, financial stability, dependencies, etc.

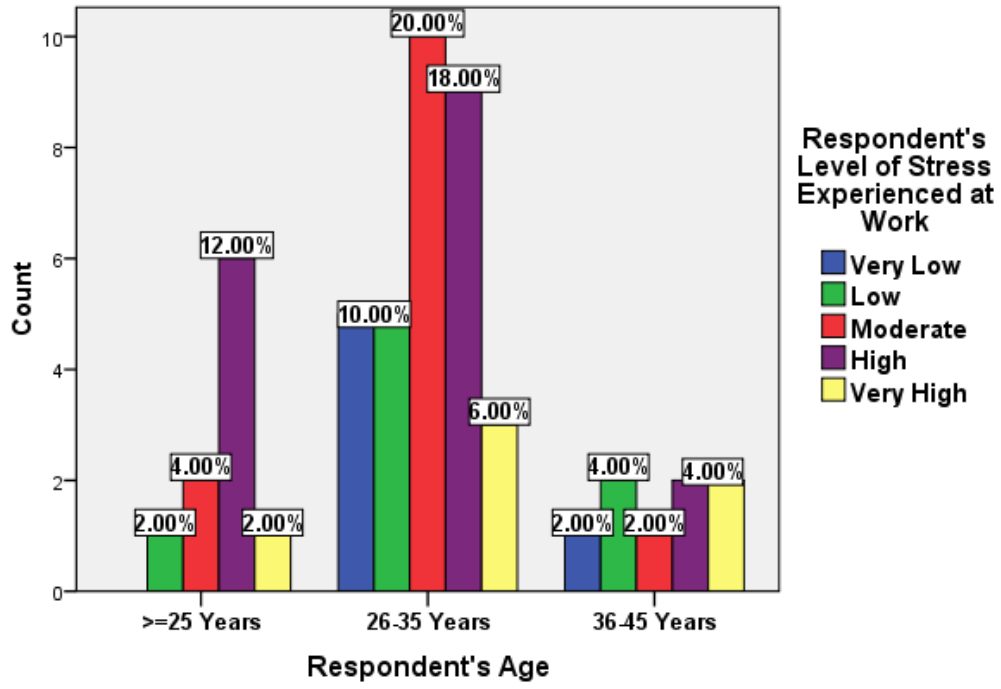


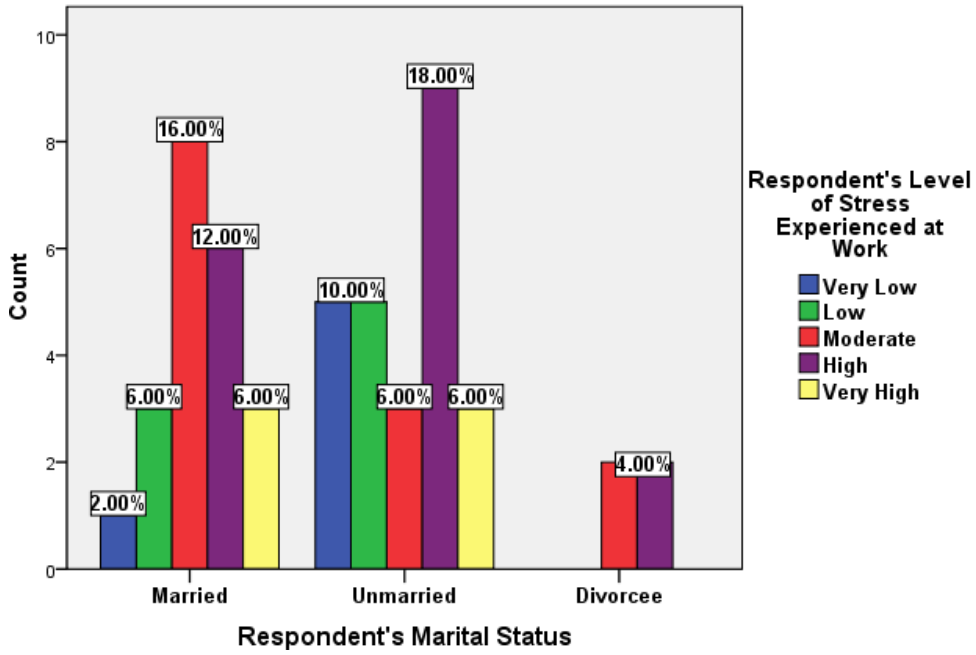
Figure 40. Levels of Stress based on the Respondent's Age

C. Hypothesis 3: There is no significant relationship between the Work Experience and the level of occupational stress A relation between work experience and level of occupational stress was found (Sig<0.05) hence, it indicated that an individual's work experience has no impact on the level of occupational stress or vice – versa. **Hence, Null Hypothesis ($H0_3$) is accepted.**

D. <u>Hypothesis 4:</u> There is no significant relationship between the Marital Status and the level of occupational stress

The relation between marital status and level of occupational stress indicated that there is linear relationship between marital status and the level of occupational stress. **Hence, Hypothesis H_40 is accepted.**

Furthermore, it can be easily depicted from the following **Figure 41** that the levels of stress are higher in the Unmarried population as compared to the rest. It is mainly because of increasing pressures of deadlines, overload and overtime, job security and achievement of higher positions in their respective fields, etc.



<u>Figure 41.</u> <u>Levels of Stress based on the Respondent's Marital Status</u>

E. <u>Hypothesis 5:</u> The use of Information Technology can be helpful in managing the levels of stress

The research analysis result shows the (Sig<0.05), which means that Information Technology can be useful in managing the levels of stress. **Hence, Null Hypothesis ($H_5$0) is accepted.**

<u>Figure 42.</u> <u>Respondents views on the Usefulness of IT in stress management</u>

In addition to above, it could be analyzed from the **Figure 42** that 62% of the respondent's feel that IT can be useful in Stress Management which could be in form of online tests/games, providing necessary information notification using m – Health, etc.

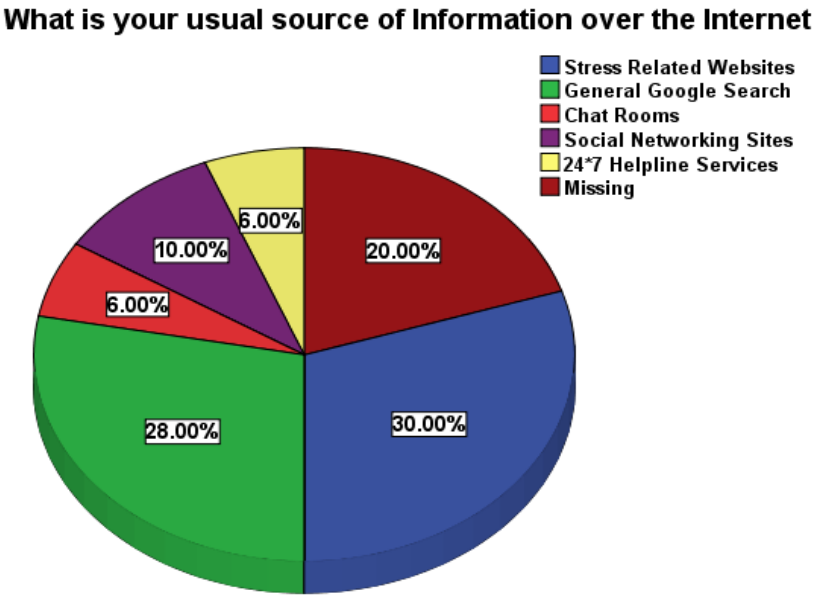


Figure 43. Sources for Stress Management over the Internet

Furthermore, when asked from the respondents about the usual source of information regarding stress management; majority of the respondents replied that the Stress Related Websites (30%) and general Google searches (28%) were the most commonly used reference for seeking stress related information **(Figure 43)**.

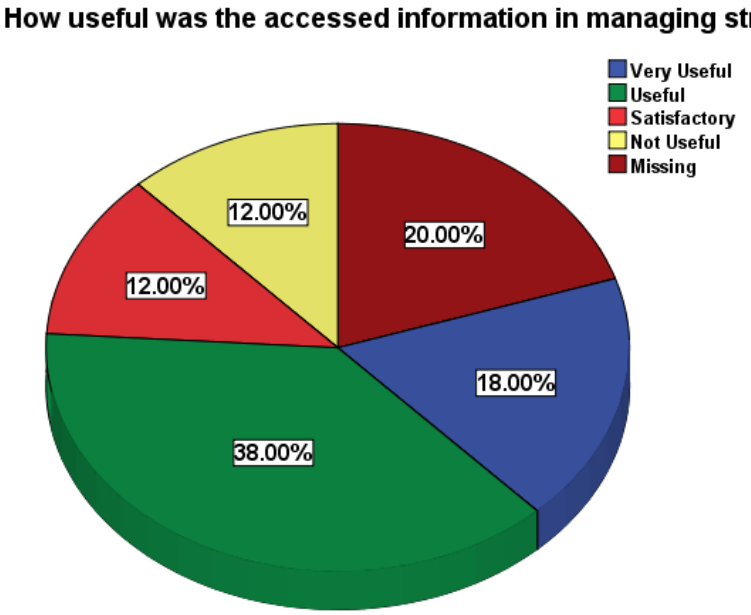


Figure 44. Reliability of Information over the Internet

Moreover, regarding the reliability of the information provided over the internet, it was found that almost 38% of the respondents **(Figure 44)** were satisfied with the information and found it useful for managing their levels of stress.

6.6 Discussion

The study found that demographic variables like age, gender and marital status do influence the level of job stress of the respondents whereas the work experience has nothing to do with the levels of stress among the IT Professionals. Moreover, the study found that job stress was found high among the higher age groups of 25 – 35 years of age, which may be because of the work pressure and routine nature of job. This finding is supported by Balasubramanian Vimala and Chokalingam Madhavi (2009) the mean values shows that the overall stress is high among employees in the group aged more than 25 years. During the study it was also found that the hours of work and work overload was indicated as one the major stressors for the increased level of job stress. Higher the hour of work higher is the job stress. Long

working hours may cause physical strain and mental strain, which may influence the job stress. This finding is supported by Kerala State Commission, 2010 found that long working hours at the desk and job related pressure creates a lot of physical discomfort and mental tension. The software engineers experienced more stress which may be because of their nature of work, deadlines and workload. This is supported by Zaki Rashidi and Amanat Ali Jalbani (2009). The present study also found that the unmarried respondents had higher levels of stress than the married respondents. Though, the married respondents did experience some levels of job stress. Furthermore, the study also found that level of occupational stress influences the quality of life of the respondents and even impacted the organizations they were associated with. Deep isolation of late hours, no social life outside of immediate family, no hobbies, and few and brief vacations may be few reasons for their high stress and low quality of life.

The study also showed that the use of an Internet-based stress management programs (ISM) can effectively reduce stress for a sustainable period. This finding can be well supported by the *Annals of Behavioral Medicine*, Cleveland Clinic researches which has discovered that the online stress management programs are more helpful in increasing accessibility for individuals affected by chronic stress at a lesser cost than traditional methods. Moreover, as per the discussion with the respondents it was found that the online relaxation practice materials, strategies to help cope with life's stressors, stress assessments programs, and daily topics to inspire participants to continue the meditation and relaxation techniques are the motivating forces for them to access the internet based stress management programs. Also, the use of internet based solutions in the recent researches (Cleveland Clinic Researches) has showed that there has been a significant decrease in perceived levels of stress, as well as had greatly improved their emotional wellbeing.

6.7 Recommendations and Conclusion

The study concludes that higher levels of occupational stress were affecting the quality of life of the majority of the respondents. It can be concluded that the demographic variables do influence the level of job stress and quality of life of IT professionals. It is clear that the demographic profiles with which people enter employer organizations ultimately affect the

IT such companies' profitability and effectiveness indirectly by impacting on the employees' job stress and job satisfaction. It is therefore advisable enterprises should ensure that, as far as practically possible; there should be adequate scope for individual customization of work content and performance reward structures, as well as characteristics of the work environment. The challenges posed by such an approach are likely to be outweighed by the benefits in terms of business performance.

Moreover, the adaption of internet based stress management programs for reducing the level of stress among the IT professionals, should be adequately used by the employers in order to reduce the levels of job stress among their employees which could in form of online relaxation practice materials, strategies to help cope with life's stressors, stress assessments programs, and daily topics to inspire participants to continue the meditation and relaxation techniques.

6.8 Limitations of the study

There are many variables which are related to occupational stress. Every individual responds differently to the stress they face depending on their personality characteristics, their unique experience in the workplace and their coping strategies.

Stress is an interactive process which involves these factors. In this research, the mere focus was on work related stress and its relationship with selected individual characteristics. Other factors such as family stress were not discussed.

The instruments used to measure the level of occupational stress may not measure validly as the measurement used to rate the stress level is based on subjective perceptions of the IT professionals rather than by more objective scientific and medical techniques. This is the second limitation for the study conducted which may produce ambiguous results.

Another limitation which would affect the results is stress levels may not necessarily remain constant. The IT professionals may feel less stressful when things are going well, but the scores may differ when things are going badly. This problem can be minimized as the research is concerned on the stress level of a group of people and not just an individual.

6.9 Assumptions

The basic assumption adopted in this study was that every IT professional experiences a certain degree of work stress. It is assumed that the level of stress is measurable based on the physiological and psychological effects on the person concerned.

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ANNEXURE

Annexure I

To Understand the Level of Stress and the Usability of Information Technology among the IT Professionals of Bangalore

1) Age

   a) >= 25years b) 26-35years c) 36-45years d) <45years

2) Gender

   a) Male b) Female c) Others

3) Educational Qualification

   a) Graduate b) Post-Graduate c) Diploma

4) Marital status

   a) Married b) Unmarried c) Divorcee

5) Number of children's

   a) 0 b) 1 c) 2 d) More than 3

6) Current Designation…..……..……

7) For how long you have been working in this field?

   a) 0-5years b) 5-10years c) 10-15years d) >15years

8) What are your working hours?

   a) 8-9hours b) 9-10hours c) >10hours

9) Do you regularly work overtime?

   a) Never b) Rarely c) Sometimes d) Often e) Always

10) What is the Level of Stress experienced by you at work?

   a) Very Low b) Low c) Moderate d) High e) Very High

11) Do you feel that you are constantly under pressure, going from one deadline to another?

   a) Never b) Rarely c) Sometimes d) Often e) Always

12) Do you feel that you have lost or are losing a sense of control in your life and that the balance you need or want is gone?

   a) Yes b) No

13) Do you find it difficult to switch off from work at weekends?

   a) Never b) Rarely c) Sometimes d) Often e) Always

14) How many cups/glasses of caffeinated drinks (coffee, tea, Coke/cola, energy drinks) do you drink daily?

a) 0 b) 1-2 c) 3-4 d) 5-6 e) 7-10

15) Do you constantly feel tired and find it hard to get to sleep or stay asleep?

a) Never b) Rarely c) Sometimes d) Often e) Always

16) Have you observed any changes in your appetite?

a) Yes b) No

17) Any increased changes in the frequency of drinking or smoking

a) Yes b) No c) N/A

18) Are you experiencing headaches or migraines which are becoming more persistent in duration?

a) Never b) Rarely c) Sometimes d) Often e) Always

19) Are you experiencing persistent backache and muscular problems?

a) Never b) Rarely c) Sometimes d) Often e) Always

20) How often have you been to your doctor for colds, flu's, infections, muscular problems or headaches in the last year?

a) 0 b) 1-2 c) 3-4 d) 5-6 e) 7-10

21) Does your organization conduct/encourage any kind of stress management programs?

a) Yes b) No

If Yes, then how often……

22) Do you feel that IT can be useful in Managing Stress?

a) Yes b) No

If No, please elaborate……

23) Have you ever accessed the internet or smart technology for seeking stress related information?

a) Never b) Rarely c) Sometimes d) Often e) Always

If option a) or b) then please do elaborate the reasons for not using it…….

24) What is the usual source of information that you access over the internet?

a) Stress Related Websites b) General Google search c) Chat Rooms

d) Social Networking Sites e) 24*7 Helpline Services

25) How useful was the information for managing your level of stress?

a) Very Useful b) Useful c) Satisfactory d) Not Useful