

INTERNSHIP TRAINING

At

GRG HEALTH, GURUGRAM

**A MARKET RESEARCH REPORT ON
GLOBAL SCENARIO FOR ACHIEVING
INTEROPERABILITY**

By

Dr. Ayushi Chaturvedi

PG/20/014

Health IT management

Under the guidance of Dr. Nikita Sabherwal

**POST-GRADUATE DIPLOMA IN HOSPITAL AND HEALTH
MANAGEMENT**

2020-2022



**INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT
RESEARCH, NEW DELHI**

COMPLETION OF DISSERTATION

The certificate is awarded to

Dr. Ayushi Chaturvedi

in recognition of having successfully completed her 3 months dissertation with effect from March 15 to June 15, 2022 and has successfully completed her Project on **A Market Research Report On Global Scenario For Achieving Interoperability**

At

GRG Health, Gurugram

She comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning. We wish her all the best for future endeavours.



Dr. Sanyal Dutta
Vice President, Life Sciences Consulting

CERTIFICATE FROM DISSERTATION ADVISORY COMMITTEE

This is to certify that **Dr. Ayushi Chaturvedi**, a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. She is submitting this dissertation titled “ **A Market Research Report On Global Scenario For Achieving Interoperability** ” at “**GRG HEALTH** ” in partial fulfilment of the requirements for the award of the **PGDM (Hospital & Health 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.

Dr. Nikita Sabherwal
Associate Dean (Training)
Associate Professor (Hospital Administration)
IIHMR, Delhi


Dr. Sujoy Datta
Vice President, Life Sciences Consulting
GRG Health, Gurugram

FEEDBACK FORM

Name of the Student: **Dr. Ayushi Chaturvedi**

Name of the Organisation: **GRG Health, Gurugram**

Area of Dissertation: Market Research (Healthcare)

Attendance: Punctual and satisfactory

Objectives achieved: Team playing, subject-matter proficiency, successful engagements

Deliverables: Analytical reports on client-specific topics of interest (MS PPT, MS Excel)

Strengths: Clinical background, learning curve, working to guidelines

Suggestions for Improvement: Multi-tasking

Suggestions for Institute (course curriculum, industry interaction, placement, alumni): Please engage industry professionals for guest lectures and sample engagements (workshops etc) so that students are better oriented to real-world roles and expectations.



Signature of the Officer-in-Charge/ Organisation Mentor (Dissertation)

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Ayushi Chaturvedi** student of PGDM (Hospital & Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at GRG Health, Gurugram from 15th March to 15th June 2022.

The Candidate has successfully carried out the study designated to him during internship training and his/her approach to the study has been sincere, scientific and analytical. The Internship is in fulfilment of the course requirements. I wish him all success in all his/her future endeavours.

Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Dr. Nikita Sabherwal
Associate Dean (Training)
Associate Professor (Hospital Administration)
IIHMR, New Delhi

CERTIFICATE OF APPROVAL

The following dissertation titled “A MARKET RESEARCH REPORT ON GLOBAL SCENARIO FOR ACHIEVING INTEROPERABILITY”

” at “GRG HEALTH, Gurugram” is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of PGDM (Hospital & Health Management) 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.

Name

Signature

**INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT
RESEARCH, NEW DELHI**

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled A MARKET RESEARCH REPORT ON GLOBAL SCENARIO FOR ACHIEVING INTEROPERABILITY and submitted by **Dr. Ayushi Chaturvedi** Enrollment No. **PG/20/014** under the supervision of Dr. Nikita Sabherwal or award of PGDM (Hospital & Health Management) of the Institute carried out during the period from 15 March 2022 to 15 June 2022 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature

1.1 GROWMAN RESEARCH GROUP

INTRODUCTION ABOUT ORGANIZATION



Started in Dec 2015, GRG Health is the business of market insights collection, analyzing and reporting for professional services clients.

We work with healthcare and consulting companies in Europe, Singapore and USA on gathering and analyzing various market level insights across a range of healthcare segments.

We are now a proud member of the prestigious European Pharmaceutical Marketing Research Association.

MartLenz

Started in 2018, Martlenz offer primary market research services across Technology, Automobile, Agriculture and few other domains.

We work with consulting companies in Europe, Singapore and USA on gathering and analyzing various market level insights across a range of business segments.

SpazeVision.

SpazeVision provides various BIM services to AEC sector across the globe. We offer all levels of design and modelling services to our clients. Our team consists of architects, engineers and BIM modelers. With our strong quality practices, we deliver high quality of BIM services to our clients.



India's 1st branded chain of advance care telemedicine centres and diagnostics.

Tattvan E Clinic offers access to quality primary healthcare to small town and rural India via physicians and multi-specialists of big town India through

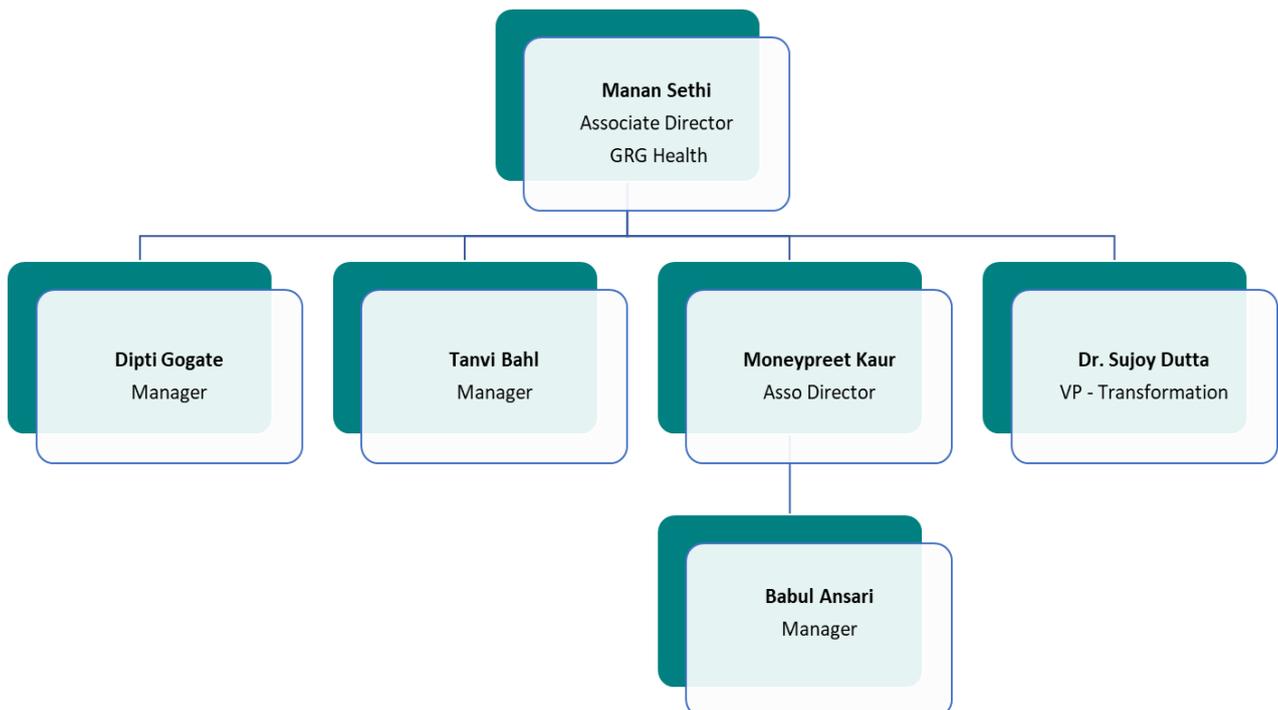
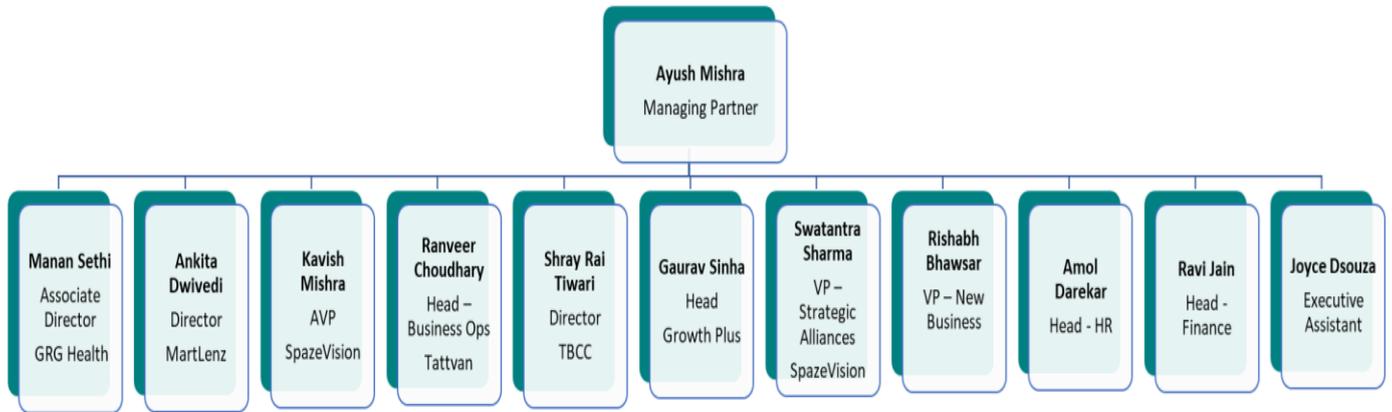
Telemedicine Technology.



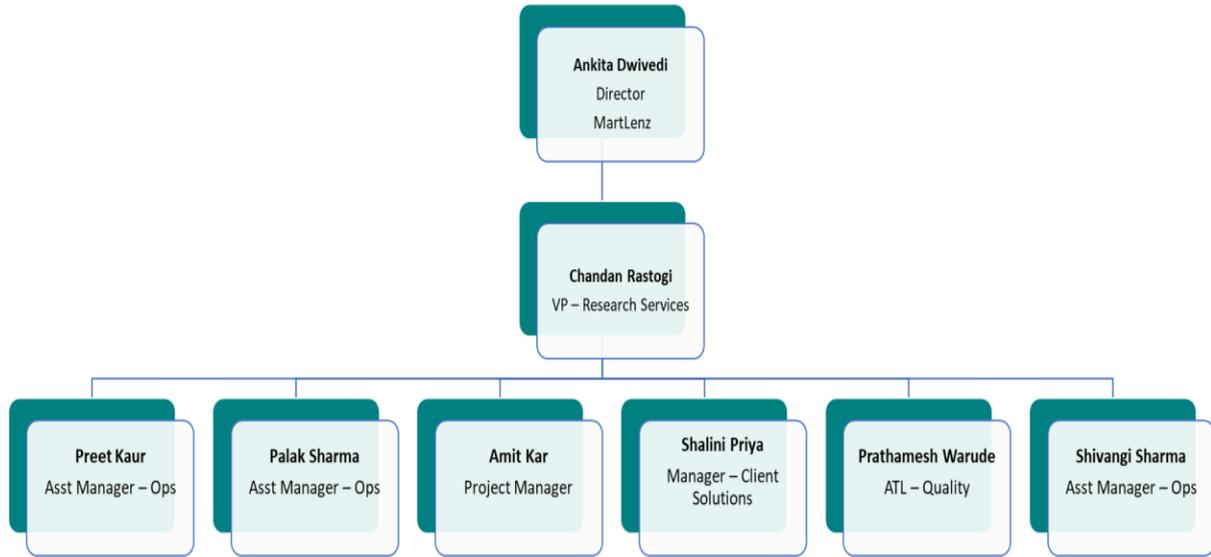
The Bareilly Creative Co.

The Bareilly creative company started in 2020 under the Growman Group banner offers creativecontent platform to viewers and creators alike.

GROUP HIERARCHY



MartLenz





Kavish Mishra
AVP – Engineering Services

Vivek Vishal
Asst Manager



Ranveer Choudhary
Head – Business Ops

Jimmy Manaen
General Manager - Marketing

Shivangi Tiwari
General Manager – New Clinics

Anant Goyal
General Manager – Clinic Installation



Gaurav Sinha
Head

Nandkishor Oza
Senior Research Analyst

Twinkle Patel
Senior Research Analyst

Table of Contents

INTRODUCTION ABOUT ORGANIZATION.....	8
GROUP HIERARCHY	11
2.2 DISSERTATION REPORT	23
2.2.1 INTRODUCTION.....	23
2.2.2 OBJECTIVE	24
2.2.3 REVIEW OF LITERATURE	24
2.2.4 METHODOLOGY.....	25
2.2.5 RESULTS.....	26
2.2.6 DISCUSSION.....	33
2.2.7 CONCLUSION.....	33
2.2.8 APPENDIX	34
2.2.9 REFERENCES	36

GRG Health

GRG is a global market research firm that helps organizations world-wide to optimize their research processes. The company offers in depth market research solutions in the field of Healthcare, Pharma, Food, Finance, IT & Telecom and Energy. With more than 28 years of experience 12 plus international languages, 56 plus countries till date during all the research projects and 10000 plus HCP, KOLs, Payer and Trade Professionals Surveys conducted annually. Research and intelligence offerings at GRG are driven by the expertise and core industrial understanding of the people within the group. A passionate group of life sciences market researchers from the base of GRG and also drives innovation in key research services and methodologies. Our research services are tailor made for specific client needs. GRG's expertise in designing custom research methodologies has enabled our clients to execute somechallenging studies with utmost ease. The years of experience and understanding of life sciences and pharma markets in APAC (Asia Pacific Countries) and EU (European Union Countries) acts as one of our greatest differentiators.

Our key services include: -

i) KOL (Key Opinion Leader) Research

ii) Treatment Flow Analysis

iii) Sales Strategy

iv) Market

Access

Stakeholders

v) Market

Research for our

clients

We can conduct telephone-based market research surveys in 56 countries across Asia

Pacific and Europe Union. Rowman Research Group (GRG) is a global market intelligence firm focused on healthcare, pharmaceuticals, medical devices and life sciences. GRG constitute of a passionate group of life sciences market researchers. They provide tailor-made services as per our client's needs. They expertise in designing custom research methodologies which have enabled us to successfully deliver some challenging studies. They have year of experience and understanding regarding life sciences and pharma markets in APAC (Asia Pacific Countries) and EU (European Union) countries. Their key services include KOL(Key Opinion Leader) research, Treatment Flow Analysis, Sales Strategy, Market Access Stakeholders and Market Research. They also conduct telephone-based market research surveys in 56 countries across the Asia Pacific and Europe. GRG has two different in-house groups of researchers each specialized in quantitative as well as qualitative research. We help our clients in selecting the right medium of data collection and provide them quality work. We share actionable insights after analysing the data collected during the fieldwork. Our research panel has 1.3 million highly participating respondents, recruited from various industries to ensure diversity. We havemaintained healthcare respondent database, which is deeply profiled and comprises of Consumer Ailment, Physicians & other Healthcare Professional database. We have a healthcare respondent database in 59 countries which includes almost all the specialty areas.

Services Offered

We ensure constant efforts are done towards increasing the quality of data which includes captured live monitoring of calls, data checks performed by the Survey Quality team, regular training programs for researchers, best practice sharing amongst different teams etc. The following services offered further simplify the project execution: -

i) Questionnaire Proofing

ii) Survey

Localization and

Translation iii)

Sample Planning and

Development

- iv) Multilingual support
- v) Data Entry
- vi) Analysis and Reporting

GRG (Growman Research Group) has a dedicated team of experienced scripters that help us designing and integrating complex questionnaires and get them online. Our project management professionals together with the skilled survey programming team help in catering to all our client needs. The survey programming professionals have excellent domain expertise and understand our client's needs. Our programmers have immense experience in using Java script, ASP and flash. The survey programming team has experience in multi-lingual surveys and can program questionnaires with complex logic checks. GRG willingness to understand its client's requirements and the commitment to deliver quality work on time sets us apart from the competitors.

COMPETITION INTELLIGENCE

MONITOR YOUR COMPETITORS, GATHER EXPERT INSIGHTS AND GROUND LEVEL INTELLIGENCE ON COMPETITION: -

Pharma and medical devices companies are faced with an interesting challenge on a day-to-day basis – the volatile nature regional/ground level competitive activities. ⁽¹⁾ At GRG, we identify competitive intelligence as a super set of two different level of insights – global level and regional level. When comes to the ever-changing landscape of emerging markets of Asia- Pacific, LATAM (LATAM is an abbreviation for Latin America) and middle east and developed markets of EU, GRG's "CI circle of researchers" have a strong history of gathering competition information on both levels (global and regional) exhaustively. We use a mix of expert interviews and secondary research to gather validated information on competition. Our CI information is populated across the following models within Pharma

and medical technology verticals.

MARKET ACCESS INSIGHT

DESIGN, PROGRAM AND HOST CATI AND ONLINE SURVEYS
WITH EASY-TO-USE REAL TIME REPORTING: -

Market Access has become increasingly important over the last 5 to 10 years because there are more and more hi-tech expensive drugs coming to market and at the same time there is enormous pressure on governments and/or healthcare systems to cut the costs of their drugs bills PH Payer Research Experts indulges on wide range of therapy area wise intelligence gathering around public VS private payer

- i) Stakeholders/KOL Insights
- ii) Pricing and Reimbursement' (P&R)
- iii) Health Economics and Outcomes Research (HEOR) Payer (or Payor) Research
- iv) Cost
Effectiveness

KOL MARKET INSIGHTS

IDENTIFY AND PROFILE OPINION LEADERS ACROSS
CUSTOM REQUIREMENTS. MAP INFLUENCE OF
KOL'S REGIONALLY ANDNATIONALLY

Healthcare firms across the globe are exploring the need for effective KOL management

strategy from a global standpoint as one of key strategic area for their annual growth plans. GRG's KOL circle of experts provides new thinking on thought leader development by its prowess in KOL identification and management.

HOW GRG BENEFIT CLIENT

Tailored approach for KOL identification brings strong value to our customers in understanding the opinion leader landscape for:-

- 1 Drug Development
- 2 Process Key marketing feedback
- 3 Product launch
- 4 Brand establishment

DEPARTMENTS:

QUALITATIVE AND QUANTITATIVE RESEARCH

Growman Research Group works from two different in-house groups of researchers each specialized in quantitative and qualitative research. With a team of experienced researchers and we are capable of conducting research projects in a myriad of languages at affordable price. We help our clients in selecting the right medium of data collection and our quality standards are unmatched in the industry. We share actionable insights after analyzing the data collected during the fieldwork. GRG research panel has 1.3 million highly participating respondents, recruited from various industries to ensure diversity. GRG has partner online research panels in Americas, Africa, Europe, and Asia Pacific. The deeply profiled panelists are a result of our continuous efforts in partner's development and maintenance.

MARKET RESEARCH INSIGHTS ABOUT MARKET RESEARCH

Markets change constantly and businesses need to have a clear understanding of both the supply and demand. The principal role of market research, therefore, is to provide businesses

with a comprehensive view of consumers and the market in order to develop products and services that satisfy their needs better than the competition. The main purpose of market research is to answer questions and help in acquiring new knowledge. Research is the quintessential tool that helps in expanding the horizons of knowledge in any field.

⁽³⁾ Owing to the dynamic nature of the market environment, there has been a marked increase in the complexity of the marketplace. Given this increased complexity of the market and the business environment, it is no longer feasible to make key decisions using a 'gut-feel' approach. There is a dire need for the decision makers to understand the market and its players in order to make informed decisions. Market research involves the capture and analysis of consumer, competitor and market trend data. This enables the customer to assess more accurately the level of demand for its products. It also influences decisions to target capital investment on projects that will offer the best return on that investment, such as opening a new store or entering a new market. Market research provides consumer feedback. It is essential for the consumer to gain insight into what they think about its range of products, brands and services. This enables the business to meet its demands and outperform the competition. It helps the business develop a clear and informed strategic business plan which all business colleagues can work towards fulfilling. For example, this information can create a winning marketing mix to target promotions to reach different customer groups or influence decisions on range planning in new stores. Research can also provide information about the size and performance of markets. ⁽³⁾ It can inform a business about who the key competitors are, what they are doing, and their market share. Potential areas of opportunity within an international, national and local context can also be identified along with:

i) Market penetration: – winning greater market share in its existing markets

ii) Market development: – entering new countries or new retail sectors

iii) Product development: – acquiring or developing new products or brands

iv) Diversification: – taking the business in a completely new

direction.

With the development of the market and the competition raised there arose a requirement for risk assessment to stay away from the dangers of market fall. The significance of data arose much than ever and effortlessly. So as to confine data from various sources the data analysis and market research were evolved. Market research is a major factor to maintain competitiveness. In an attempt to understand whether the essential deliverables are being received from the market plans the strategists developed the researching procedure which duly developed to market research.

Market research, which also includes social and opinion research, is the organized assembly and understanding of information about individuals using the statistical and analytical (ICC/ESOMAR 2008), methods and techniques of the applied social sciences to support decision making. Market research is any combined effort to gather information about target markets or customers.

Need for Market Research

For any decision maker, it is imperative to identify and understand the customers, what they desire in terms of products and services and their purchasing power or capacity. Due to globalization of the marketplace, the system has been segmented heavily, increasing the gap between the consumers and the decision makers. One of the key aspects of a successful business is customer retention. Most people fail to address the ever-changing demands and standards of their customers and end up losing their consumer base. Considering this, market research can be broadly classified into: -

- i) Problem identification research
- ii) Problem solving research

Classification helps in providing a better perspective to the problem at hand. However, there are no strict rules when it comes to the two types of market research. A research project can involve both the types simultaneously.

i) Problem Identification Research: This is the introductory phase of the marketing research process. Basically, it involves a clear and precise understanding of the problem at hand. It is crucial that the research team identifies, understands and defines the problem in its entire capacity, as it affects all the subsequent activities involved in the research process. Research teams make use of customer feedback, internal and external data reports, sales graphs, purchasing patterns, etc. to come up with an accurate problem definition. It helps in identifying new market opportunities for

existing and new products. It provides information on market share, nature of competition, customer satisfaction levels, sales performances and channel of distribution. This helps the firms in solving problems.

ii) Problem Solving Research: Identifying the percentage of women who prefer hormone replacement therapy for the treatment of vulvo vaginal atrophy and segmenting them according to their purchasing power.

Content of Market Research:

- Quantitative research is numerically oriented, requires significant attention to the measurement of market phenomena and often involves statistical analysis. For example, a bank might ask its customers to rate its overall service as excellent, good, poor or very poor. This will provide quantitative information that can be measured statistically. The main rule with quantitative research is that every respondent is asked the same series of questions. The approach is very structured and normally involves large numbers of interviews/questionnaires
- Perhaps the most common quantitative technique is the 'market research survey'. These are basically projects that involve the collection of data from multiple cases – such as consumer or a set of Product. Quantitative Survey can be conducted by using post (self-completion), face-to-face (in-street or in-home), telephone, email or web techniques. The questionnaire is one of the more common tools for collecting data from a survey, but it is only one of a wide-ranging set of data collection aids.
- Qualitative research provides an understanding of how or why things are as they are. For example, a Market Researcher may stop a consumer who has purchased a particular type of bread and ask him or her why that type of bread was chosen. Unlike quantitative research there are no fixed set of questions but, instead, a topic guide (or discussion guide) is used to explore various issues in-depth. The discussion between the interviewer (and moderator) and the respondent is largely determined by the respondents' own thoughts and feelings.
- As with quantitative techniques, there are also various types of qualitative methodologies. Research of this sort is mostly done face-to-face. One of the best-known techniques is market research group discussions (or focus groups). These are usually made up of 6 to 8 targeted respondents, a research moderator whose role is to ask the required questions, draw out answers, and encourage discussion, and an observation area usually behind one-way mirrors, and video and/or audio taping facilities. (3)
- In addition, qualitative research can also be conducted on a 'one on one' basis i.e., an in-depth interview with a trained executive interviewer and one respondent, a paired depth (two respondents), a triad (three respondents) and a mini group discussion (4-5 respondents).

Components of Market research

Market information: - Through Market information one can come to know about the prices of different products in the market, as well as the information about supply and demand conditions. Market researchers have a major role than previously renowned by helping their clients to understand social, legal and technical aspects of markets.

Market segmentation: - Market segmentation is the splitting up of the market into subgroups with similar motivations. It is majorly used for segmenting on geographic differences, demographic differences, personality differences, use of product differences, gender differences.

Market trends: - Market trends are the upward or downward movement of a market, throughout a specific period of time. Market size may be more difficult to determine if one is starting with a new innovation. In this case, one needs to obtain the figures from the significant number of potential customers.

SWOT Analysis: - SWOT analysis is a written investigation of the Strengths, Weaknesses, Opportunities and Threats to a business body. SWOT analysis should not only be used in the initial stages of the company but could also be used through the entire life cycle of the company. A SWOT may also be used to understand the competition and how one needs to develop the marketing and product mixes. Besides knowing only about the target market, one should also have information about one's own competitors, customers, products, etc. (Castell, S. and Thompson, J., 2005)

Types of Market Research

Market research can be usually categorized into two kinds: primary research and secondary research. In turn, the information one gathers is of two types: Qualitative Market Research information is achieved by actually talking to people, asking for the feedback and/or opinions, while in Quantitative Market Research, the information is achieved from figures and numbers in the form of charts, statistics, graphs and tables.

PRIMARY RESEARCH

Whenever someone is talking to customers or competitors, one is collecting the primary market research information. Mostly this will be qualitative information. This is usually the most valuable market research information for one's business. It is the collection of data first hand from relevant sources. It is usually collected through in-depth interviews (CATI, CAWI), surveys or focus groups.

1. Surveys: - Surveys are one of the most basic forms of primary data collection. Surveys

can be conducted through mail, telephone (CATI), online (CAWI) and face-to-face interviews. Factors like number of respondents, type of data to be collected, the time frame and the budget, influence the method of survey to be adopted.

2. Mail survey: - Mail survey is an inexpensive mode of primary data collection, especially

when the data has to be collected from a number of respondents belonging to varying regions of interest. Furthermore, questionnaires can be fairly long in the case of mail interviews. One of the major disadvantages of the mail surveys is the low response rates and the time it takes to get a response. Another issue that is faced is the misunderstood or skipped questions and the vagueness of the answer. (4)

3. Telephone survey: - As the name suggests, telephone surveys involve calling the respondents and asking them questions over the phone. This enables the interviewer to encourage the respondent to participate in the survey and get immediate responses to the questions. This is a favourable mode when the sample size is not too large.

4. Computer Assisted Telephonic Interviewing (CATI): - CATI has gained a lot of popularity in the recent years compared to the traditional telephone method. CATI uses a computerized questionnaire which is administered to the respondents over the telephone. The interviewer basically reads the questions from the computer to the respondents and records the answer directly on the screen. The computer systematically guides the interviewer showing one question at a time.

5. Internet Survey: - If the respondents have access to the internet, then this is one of the most convenient ways to carry out a survey. It is faster than mail surveys and depending on how it is hosted, it can be cost-effective too. It provides all the fundamental advantages of all forms of offline interviews with the added benefit of interactivity and speed. The main disadvantage of internet surveys is to contact the respondents and convincing them to take the online survey. **6. In-person Interviews:** - In-person interviews are an effective way to complete a survey and to be able to immediately analyse the responses. However, it can prove to be costly if it involves a large sample size. Willingness of people to confide in a stranger can also be one of the issues that may arise during in-person interviews.

7. Survey Strategies: - Pilot surveys are an important part of the survey process. Pilot surveys or focus groups help in determining the validity and effectiveness of the questions being asked. This helps in refining the survey questions so that it serves the intended purpose without being too complicated for the respondents to understand. (4) The questions being asked in the survey are as important as the type of survey being used. It has to appeal to the target audience in order to get maximum number of responses.

There are a number of ways in which questions can be posed to the respondents:

8. Multiple-choice questions: - This format first poses a question to the respondent and then provides multiple answer options to choose from. The multiple-choice format also allows the

respondent to choose one or more responses of their liking. This format is very easy for the respondent to understand. However, questions with more than one option selected are difficult to analyses.

9. Rating-scale questions: - In this type of questions, respondents are asked to indicate their level of agreement or acceptance with a statement. This provides a measurable or a quantifiable data which is easy to analyse and interpret. These types of questions are very simple and easy to understand for the respondents. However, they cannot be used for all types of surveys.

10. Nomination surveys: - Nomination survey or study is done to identify Key Opinion Leaders (KOLs) or experts in a particular field. Nomination survey respondents usually also belong to the same field. In nomination surveys, respondents are asked to nominate people who they consider as experts.

SECONDARY RESEARCH

Secondary research involves the research of data that has already been collected and is available in either electronic or published form. Secondary data is always collected, organized and analyzed with a specific purpose. Therefore, its applications may be limited. However, the cost and time saving aspect of secondary research is advantageous, especially if there are budget constraints. Secondary data is readily available from sources like government agencies, published articles, company reports and news articles.

Client-based Market Research

Client-based marketing research is involved with the construction, analysis and interpretation of data on organizations as well as on their respective environments, so that information can be provided to help the client organizations in diagnosing, deciding and delivering marketing strategies and tactics. Figure 3 illustrates the process. The aim is to deliver value points to the clients and to provide data, information and inputs that are relevant and actionable. Client-based marketing research is often referred to as “commissioned”, “commercial”, “market” or “practitioner” research. If the client is another organization, there will certainly be a fee involved for the services offered; in short, it will be a commercial transaction between the client organization and the market

research agency, in which the research is undertaken by an agency for a profit. This does not depend on whether the client organization is itself commercial or non-profit. If, however, the client is an existing part of the research agency, then it will be called “in-house” research project. In this situation, there may or may not be a fee for the services offered. But, it will be different from the kind offered by an external client. There is a further category

of applied or policy research, which although not commercial is still client-based. In this type of research, the research work is carried out by an academic body on behalf of a governmental organization, quasi government or local authorities. Although, in recent times, professional market research agencies have been also used for applied or policy research. There has also been a sudden growth in a range of non-profit clients, for example, educational institutions, political parties, museums and galleries, the performing arts or even religious institutions. Not all client-based research is necessarily commercial in nature. Research is undertaken to solve, or help diagnose and identify, client's problems and its value or quality is judged on the basis of its success in doing so and not on the basis of the scientific rigor that was employed to carry out the research. However, this does not mean that client-based research is not rigorous; only that rigor is a way to approach the end, not an end in itself. After all, rigorous research is more likely to help solve the client's problem; but rigor is subject to degree and it requires monetary input. A degree of rigor applied will depend on the extent required to sufficiently meet the project objectives without compromising on the quality of work.

The solutions are usually compiled together in a form of a report that contains a set of recommendations and actionable directions to the client. Often, academic researchers also make recommendations to the industry at large and not to a specific organization, and they will be secondary to the exploration or testing of theoretical ideas and the advance of understanding of marketing phenomena.

The second feature of client-based research is that it is never neutral. It is a partisan and it operates on behalf of the client. This is not to say that such research lacks objectivity; it is a kind of "partisan objectivity". The data, evidence, information, interpretation and even speculation should be uncoloured by the researcher's subjective preferences, emotions or sensations. It will always focus on what is important to the client while assuring that what is actual, practical and external is presented to the client to ensure validity of the research. Most client-based research will be interventionist. The main objective will be to make changes and monitor their effects or to assist the client to bring about certain desirable changes.

The outcome of the research will sometimes be the recommendation that no changes be made, but this is rare, and it still focuses on the issue of change or no change. Client-

based research is carried out for a third party, so the researcher does not decide, originate or “own” the research problem. It is the client who has the problem and takes the initiative. The client will approach a research agency; the client will have a discussion with the agency in which the client will explain the problem that they are facing and his or her perception of the situation and in varying degrees of detail how the research is envisaged; the client is responsible to choose the agency where the

research is in a commercial context; the client will be final decision maker in case an alternative course of action is being considered. Client-based research are always time and cost constrained. The researcher will need to adhere to a budget and there may be severe penalties for not meeting deadlines. The key output of client-based research is usually a report. Reports may be hard copy, face-to-face presentations, or, more likely, some combination of the two.

HEALTHCARE AUDIENCE REACH

The healthcare respondent database is deeply profiled and comprises of Consumer Ailment, Physicians & other Healthcare Professional Database. GRG has healthcare respondent database in 59 countries and has a fair representation of all specialty areas. They ensure the engagement of the Healthcare respondent database and as a result they have highly responsive

respondents through CATI and Online mediums. One of the highlights and differentiators of our database is our unparalleled access to KOLs, Market Access Stakeholders, Trade Professionals, Distributors, Health Economists, Lab Professionals, Lab Owners, etc.

PHONE BASED DATA COLLECTION (CATI) CAPABILITIES

GRG CATI data collection team has multi-lingual and cross functional domain expertise that helps in catering to the multi-geography research projects. The global reach coupled with seamless technology and our multi-national interviewing team executes research projects that confirm high quality. The constant efforts towards increasing the quality of data captured live monitoring of calls, data checks performed by the Survey Quality team, regular training programs for researchers, best practice sharing amongst different teams etc. The following services offered further simplify the project execution –

- i) Questionnaire Proofing
- ii) Survey Localization and Translation
- iii) Sample Planning and Development
- iv) Multilingual support
- v) Data Entry
- vi) Analysis and Reporting

WEB BASED DATA COLLECTION (CAWI) CAPABILITIES

With the in shift in demand for online research over CATI, GRG and their partners recruited a global panel of decision makers and influences across business functions and industries. The detailed profiling of their partner panellists helps GRG in targeting executives from various industries and helps in reducing respondent fatigue. ⁽²⁾ They offer global sample services to the clients to execute research projects with a short turn around at an economical price. The following services are also offered as a bundle in Online Research: –

- i) Questionnaire Proofing
- ii) Survey Localization and Translation

iii) Survey Designing and Hosting

iv) Multi-lingual Surveying

v) Real-time Online Reporting

SURVEY PROGRAMMING

GRG has a dedicated team of experienced scripters that help them in designing and integrating complex questionnaires and get them online. The project management professionals together with the skilled survey programming team help in catering to all the client needs. The survey programming professionals have excellent domain expertise and understand the client's needs. GRG scripters have been sourced from industry leaders in survey programming. GRG offers tool based or custom programming and hosting services, they share online reporting link with the clients to provide real-time updates. Their programmers have immense experience in using Java script, ASP and flash. The survey programming team has experience in multi-lingual surveys and can program questionnaires with complex logic checks. ⁽²⁾ GRG willingness to understand its client's requirements and the commitment to deliver on time sets it apart from the competitors.

EXPERTISE INCLUDES: –

1. CATI Programming
2. Web Based Survey Programming
3. Online Reporting
4. Quality Assurance
5. Visual QA
6. Audio/Videos Rating Tools
7. Flash implementations

2.2 Dissertation Report

2.2.1 INTRODUCTION

Free resource sharing between various systems is made possible by the interoperability attribute. This can be described as the capacity to move data between separate parts or machines using both software and hardware, or as the sharing of data and resources through local area networks (LANs) or wide area networks between various systems (WANs).

Interoperability, in general, refers the ability of two or more parts, systems, or components to exchange and use information.

Types of interoperability

Interoperability can be divided into two categories:

1. Syntactic interoperability is the capacity of two or more systems to communicate and share data. It makes it possible for various software components to cooperate despite having dissimilar user interfaces and programming languages.
2. Semantic Interoperability is defined as the capacity of health IT systems to actively use the information exchanged, analyse it, and exchange it. Semantic interoperability enables doctors to share patient summary data with other caregivers and authorised parties using various EHR systems, enhancing the quality, safety, and effectiveness of care. This level of interoperability enables healthcare institutions to communicate patient data in real time, reducing duplication of testing, enabling better-informed clinical decision-making, and preventing adverse health outcomes. Effective health data exchange can also help hospitals enhance care coordination, minimize readmissions, and save money in the long run.

2.2.2 OBJECTIVE

General objective

- This study aims to understand at an institutional level, the IO needs and evaluate an IO service offering
- To study the challenges faced using interoperability

Specific Objective

- Objective of this study is to understand market scenario of interoperability globally.

2.2.3 REVIEW OF LITERATURE

Gulzar H. Shah et.al conducted a study in 2016 to describe the level of interoperability of LHD (Local Health Department) information systems and identify factors associated with lack of interoperability. A representative sample of 650 LHDs was drawn using a stratified random sampling design. Qualitative data were used from a key informant interview study of LHD informatics staff from across the United States. For 30% of LHDs, no systems were interoperable, and 38% of LHD respondents indicated some of the systems were interoperable. The study concluded that Interoperability of all systems may be an informatics goal, but only a small proportion of LHDs reported having interoperable systems, pointing to a substantial need among LHDs nationwide¹.

Wajahat Ali Khan et. Al conducted a study in 2012 where they proposed system that enable high level of accuracy of mapping between heterogeneous healthcare standards model. The proposed architecture shows the use of ontology mappings for achieving interoperability among HIS's compliant to heterogeneous healthcare standards. They described the system working model by proposed Algorithms for accuracy and message instance conversion of mappings. The study concluded that Semantic interoperability is of prime importance for healthcare systems to communicate with each other and provide better healthcare facilities to patients².

Blobel in 2018 did a study on Interoperable EHR Systems, their Challenges, Standards and

Solutions. The paper discussed EHR types, implementations and standards, starting with different requirements specifications, systems and systems architectures, standards and solutions. Existing standards and specifications are compared with changing requirements, presenting weaknesses and defining the advancement of EHRS, architectures and related services, embedded in advanced infrastructure systems. The study concluded that future EHR systems are components in a layered architecture with open interfaces. The need of verifying data models at business domains level is specifically highlighted. Such approach is enabled by the ISO Interoperability Reference Architecture of a system-oriented, architecture-centric, ontology-based, policy-driven approach, meeting good modeling best practices³

Juan González-García et al. conducted a study in 2021 on coping with interoperability in the development of a federated research infrastructure. Following a federated analysis approach, JA-InfAct developed an ad hoc federated infrastructure based on distributing a well-defined process-mining analysis methodology to be deployed at each participating partners' systems to reproduce the analysis and pool the aggregated results from the analyses. The study concluded that the proposed approach, when successfully deployed as a federated analysis infrastructure, such as the one developed within the JA-InfAct, can concisely tackle all levels of the interoperability requirements from organisational to technical interoperability, supported by the close collaboration of the partners participating in the study⁴.

2.2.4 METHODOLOGY

The study is a descriptive cross-sectional study both primary and secondary data.

Two layered methodology was opted to extract and validate the data points by key professionals with 5-6 years of rich experience from healthcare streams i.e. Hospitals, healthcare facilities

Government websites, research papers, Newspapers, articles

Research tool

Quantitative questionnaire-based study

Sample size

120

Target population

Institutions/users using interoperability

Time of study

March-May 2022

Inclusion criteria

Doctors, users and hospitals currently using interoperability

Exclusion criteria

Others who haven't used interoperability

Limitations

- Due to lack of resources the sample size will be limited.
- The survey only addresses the people who are aware and using interoperability in their organizations.

Ethical consideration

- Confidentiality will be ensured and will explicitly state in consent form
- During the process of data collection and data entry due data security will be followed

ETHICAL CONSIDERATION

- For the ethical consideration part I will be taking the consent of the users in the questionnaire itself by asking them if they want to participate in the survey or not.

2.2.5 RESULTS

120 respondents interviews were conducted

France=10

Australia=16

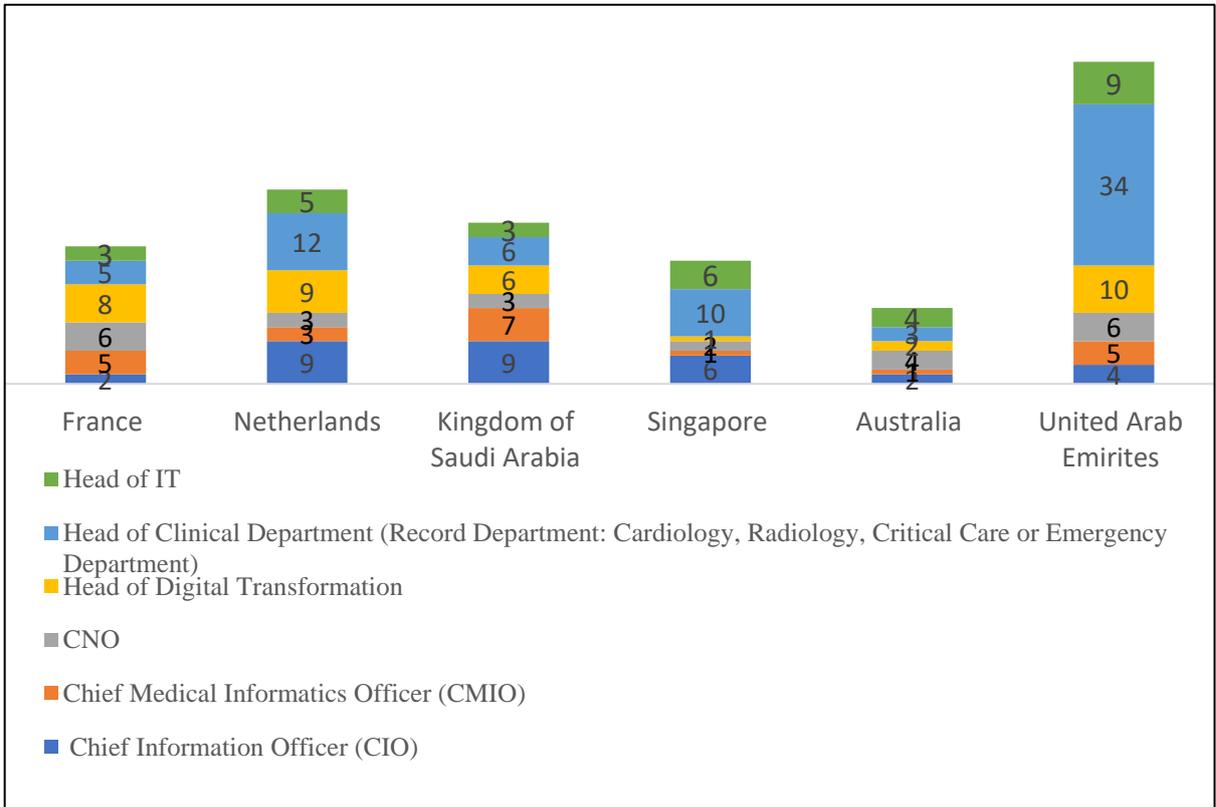
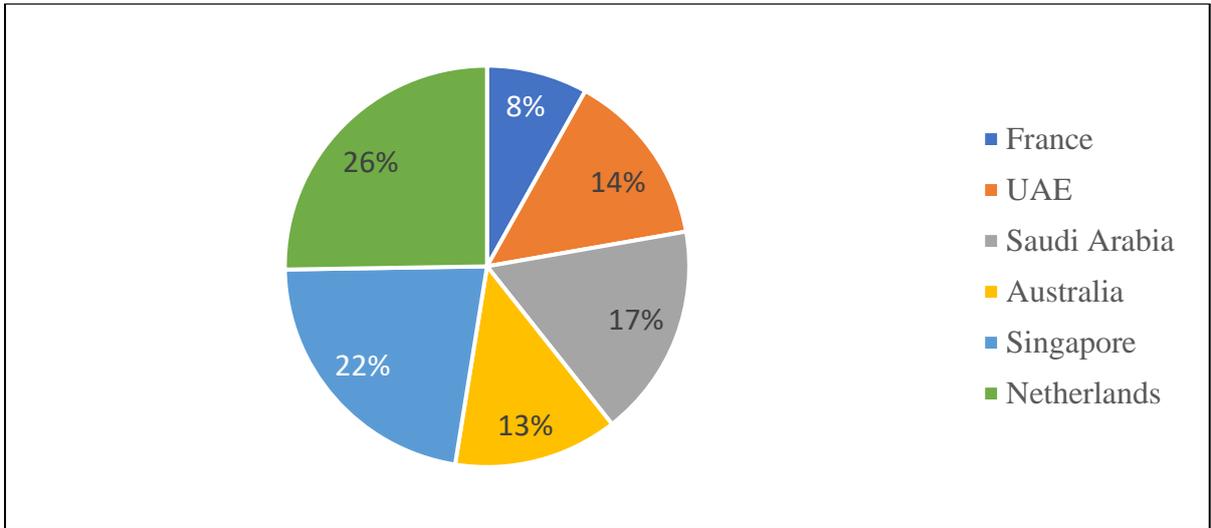
Singapore =26

Netherlands =30

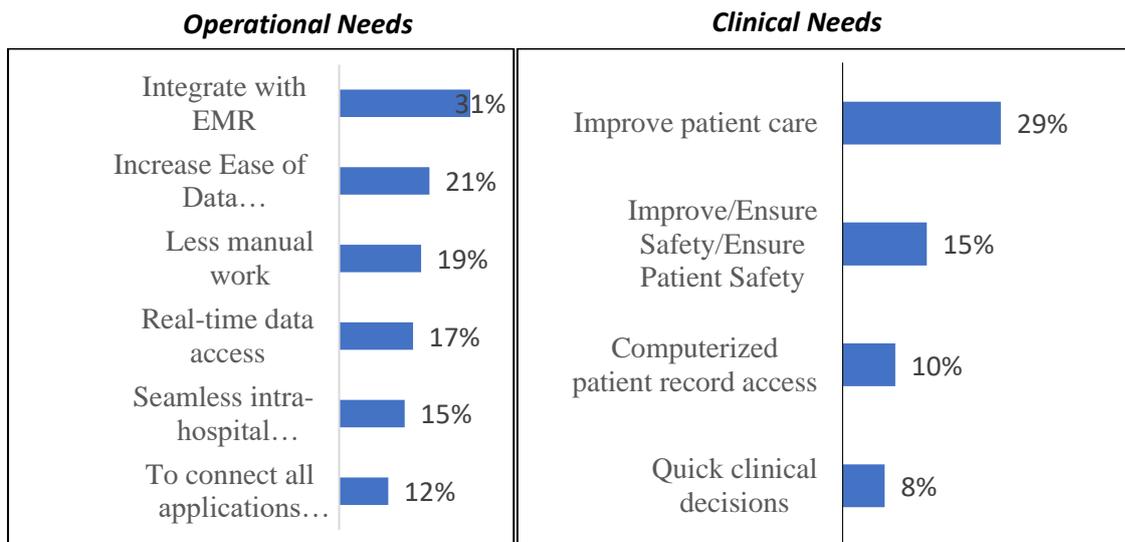
UAE=17

Saudi=20

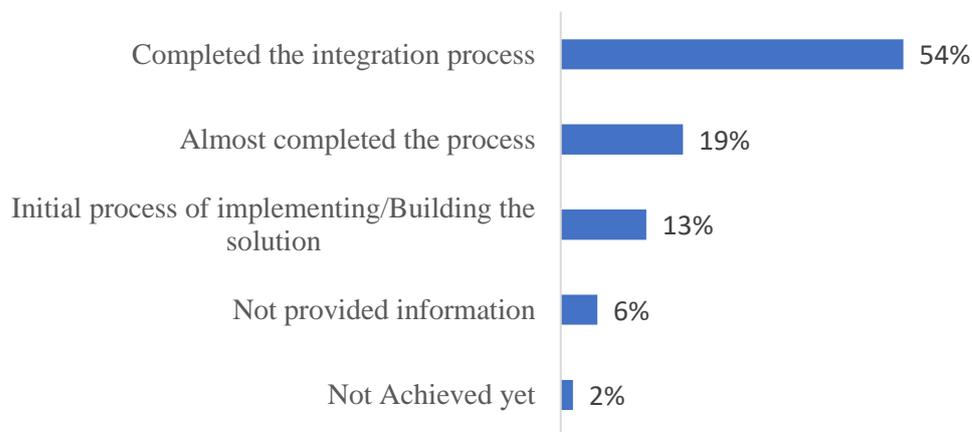
Respondents by country N=120



Top needs for interoperability (N=120)

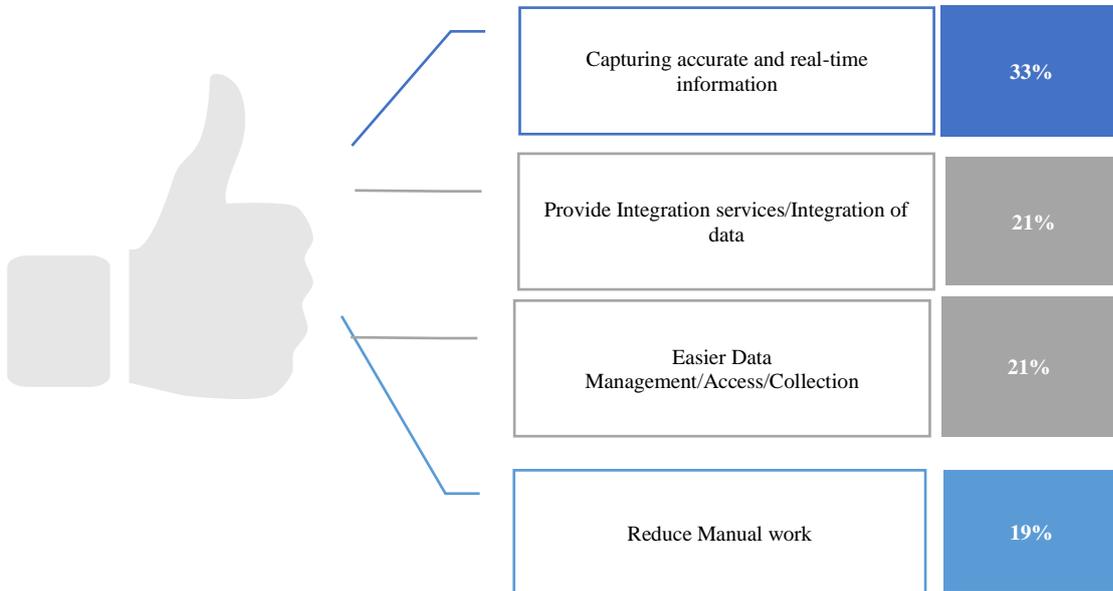


Stage of Achieving Interoperability (N=120)



- Streamlining the workflow , digitization and ease of data accessibility are some of the key performance targets that are focused by the hospitals.
- Most of the hospitals have completed or are on the verge of completing the integration process.

Top Benefits of Current IO Solution (N=120)

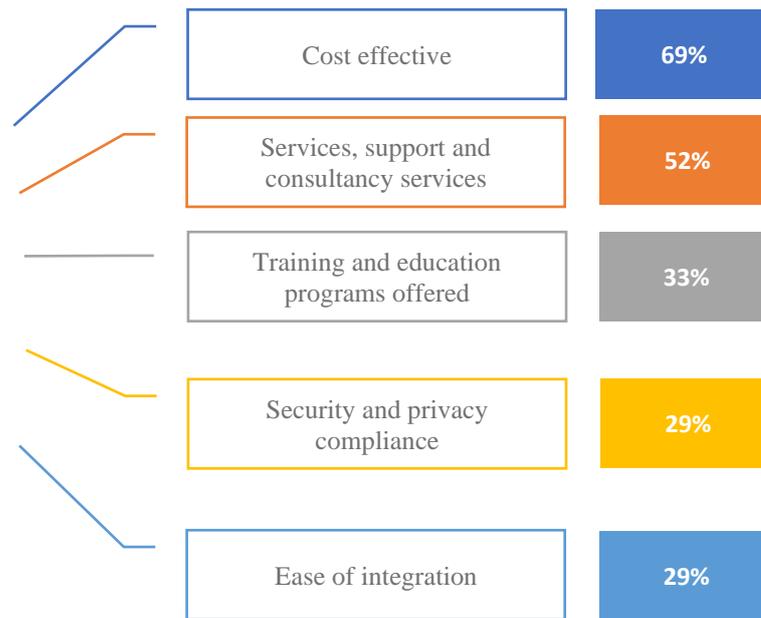


Challenges of Interoperability (N=120)



- IT solution should follow IO standards
- Cannot measure Device Utilization
- Lack of training and guides.
- Difficult to manage multiple department solutions at one time
- No data integration with other dept
- Startups not following HL7
- Lack of integration of IO solution with outside facilities /government records

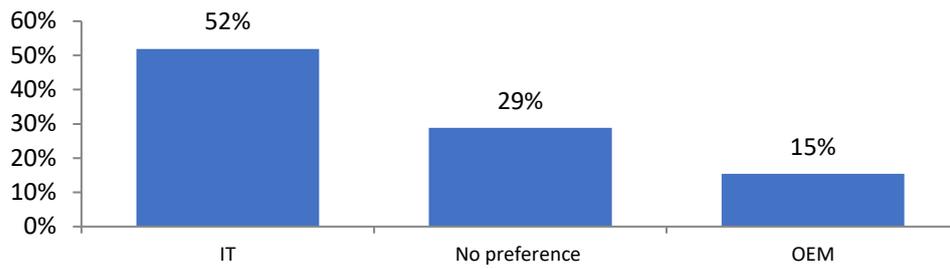
Top 5 most important factors considered when selecting an IO solution vendor



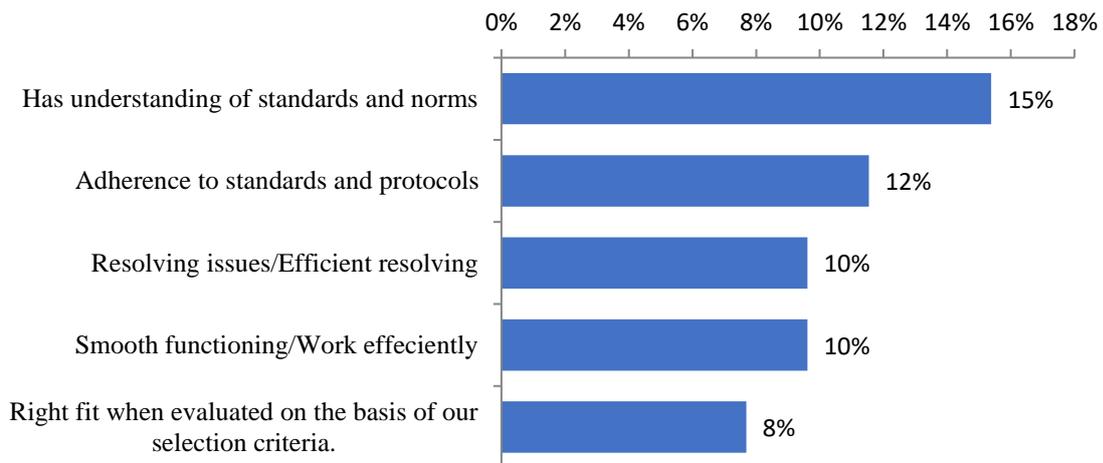
Other key expectations from vendors includes

- Maintenance and servicing support
- Training
- Technical/Telephonic Support
- Monitoring implementation impacts of the solution
- On-boarding and implementation support
- Upgradable with emerging needs/Help with Upgrades
- Customization Support/ services
- Quick response
- Simplifies integration of applications and collection of data

Preferred Vendors for IO Solution



Top Reasons influencing Vendor Preference



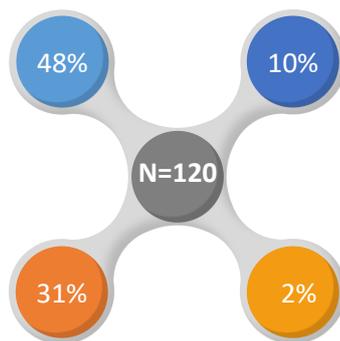
Preferred Business Models

Subscription Services

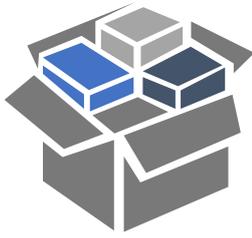
Pay per Use

Initial investment and recurring costs

Fixed price based on statement of work



Preferred Approach N=120



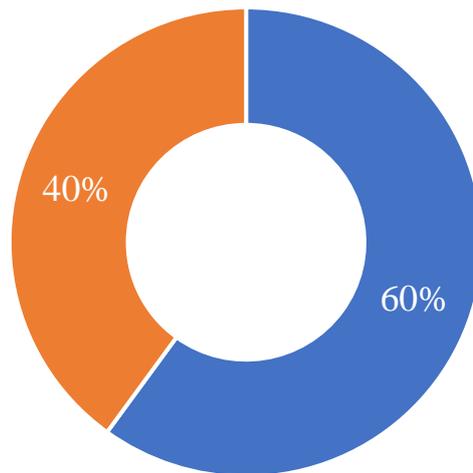
Preferred Approaches

End-to-end solution approach that includes all the 4 stages: Assessment, Implementation, Program Management and Foundational Integration

Phased/ Modular Approach (Assessment followed by free choice of any third-party IO solution/ Assessment followed by the combination of Implementation, Program Management and

Hybrid Approach (Interoperability Platform/ Message Broker + Select Services)

Preferred Approach N=120



■ End-to-end solution ■ Phased/Modular Approach ■ Hybrid Approach

Benefits identified by obtaining interoperability

- For Capturing accurate and real-time information
- Provide Integration services/Integration of data
- Easier Data Management/Access/Collection
- Reduce Manual work

Challenges identified in obtaining interoperability

- IT solution should follow IO standards
- Cannot measure Device Utilization
- Lack of training and guides.
- Difficult to manage multiple department solutions at one time
- No data integration with other dept
- Startups not following HL7
- Lack of integration of IO solution with outside facilities /government records

2.2.6 DISCUSSION

There is a lot of awareness amongst healthcare personnel about interoperability. The most preferred business model is Subscription model as consumers pay for a service or product on a constant schedule. They limit the amount of time and frequency with which they would like to receive every offer, and most subscriptions enable them to cancel or renew at anytime.

2.2.7 CONCLUSION

In addition to giving doctors and other healthcare professionals a more full view of their patients, health data interoperability benefits organizations throughout the healthcare sector. If health information systems were more integrated, health plans might better understand their service demand and utilization rates. Demographic information would be available to government service providers so they could identify trends and meet the needs of their constituents. Large datasets could also be used by life science businesses to carry out quicker, more accurate research.

With better interoperability, organizations may stop considering people as patients one day, health plan members the next, and users of health apps the next. Instead, decision-makers across the industry may start looking at how people access and use health information, regardless of where it comes from, in order to improve care models, boost patient safety, and enhance the experiences of those they serve.

2.2.8 APPENDIX

Survey Questionnaire

A Market Research Report On Global Scenario For Achieving Interoperability

The health interoperability ecosystem is made up of people, systems, and procedures that want to share, exchange, and access various kinds of health information, including discrete, narrative, and multimedia. Individuals, patients, providers, hospitals/health systems, researchers, payers, suppliers, and systems are all potential participants in this ecosystem. Every one of them contributes to the production, sharing, and use of health data and/or information.

In order to facilitate the smooth and secure capture, discovery, exchange, and application of health information, an effective interoperability ecosystem offers an information architecture that makes use of technological standards, regulations, and protocols.

Questionnaire

1. Are you currently using any IO solution in your hospital?
2. What is your professional role?
 - a) Chief Information Officer (CIO)
 - b) Chief Medical Informatics Officer (CMIO)
 - c) CNO
 - d) Head of Digital Transformation
 - e) Head of IT
 - f) Head of Clinical Department (Record Department: Cardiology, Radiology, Critical Care or Emergency Department)
 - g) Others
3. . Which one of the following best describes the facility where you spend the majority of your professional time?
 - a) Academic/University hospital – Teaching
 - b) Public hospital – Non-teaching
 - c) Public hospital – Teaching
 - d) Private hospital – Non-teaching
 - e) Private hospital – Teaching

- f) Outpatient Centers (e.g., Imaging, Cardiology)
 - g) Charitable hospitals
 - h) Non-profit/Confessional hospital
 - i) Private practice – Office-based
 - j) Private practice – Clinic-based
 - k) Privately owned clinic focusing on one specialty
 - l) Others
4. What are your IO goals and when do you aim to achieve this?
- a. What is the type of IO goals? Please elaborate.
 - b. What (performance) targets are set?
5. What are the main benefits (top 3) of your IO solution?
6. What are the main drawbacks/challenges of your IO solution?
7. What type of vendors (OEM, IT Company) would you prefer for your Interoperability solution? Please provide top 3 reasons why?
8. What is the payment model of your current IO solution?
- a) Initial investment and recurring costs?
 - b) Pay per use?
 - c) Subscription?
9. How would you prefer to approach a service solution like this?
- a. End-to-end solution approach
 - b. Phased/ Modular Approach
 - c. Hybrid Approach
 - d. Other
10. What are the top 5 most important factors you consider when selecting an IO solution vendor?

2.2.9 REFERENCES

1. Shah GH, Leider JP, Luo H, Kaur R. Interoperability of Information Systems Managed and Used by the Local Health Departments. *Journal of Public Health Management and Practice*. 2016 Nov;22(Supplement 6):S34–43.
2. Khan WA, Khattak AM, Lee S, Hussain M, Amin B, Latif K. Achieving interoperability among healthcare standards: building semantic mappings at models level. In: *Proceedings of the 6th International Conference on Ubiquitous Information Management and Communication - ICUIMC '12* [Internet]. Kuala Lumpur, Malaysia: ACM Press; 2012 [cited 2022 Jun 12]. p. 1. Available from: <http://dl.acm.org/citation.cfm?doi=2184751.2184868>
3. Blobel B. Interoperable EHR Systems - Challenges, Standards and Solutions. *ejbi* [Internet]. 2018 [cited 2022 Jun 12];14(2). Available from: <https://www.ejbi.org/scholarly-articles/interoperable-ehr-systems--challenges-standards-and-solutions.pdf>
4. González-García J, Estupiñán-Romero F, Tellería-Oriols C, González-Galindo J, Palmieri L, Faragalli A, et al. Coping with interoperability in the development of a federated research infrastructure: achievements, challenges and recommendations from the JA-InfAct. *Arch Public Health*. 2021 Dec;79(1):221.
5. What is interoperability in healthcare? [Internet]. Boston Technology Corporation (BTC). 2021 [cited 2022 Jun 17]. Available from: <https://www.boston-technology.com/blog/what-is-interoperability-in-healthcare>
6. Interoperability in healthcare | ibm [Internet]. [cited 2022 Jun 17]. Available from: <https://www.ibm.com/in-en/topics/interoperability-in-healthcare>
7. Interoperability in healthcare | himss [Internet]. 2020 [cited 2022 Jun 17]. Available from: <https://www.himss.org/resources/interoperability-healthcare>

