Evaluation of Online Appointment Systems and Challenges in a Multi-Specialty Hospital at Jaipur

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Abstract— This study investigates the implementation and effectiveness of online appointment systems in a multi-specialty hospital, focusing on the system's adoption rate, user satisfaction, and operational challenges. The research employs a descriptive design and utilizes quantitative methods to analyze data from a sample of 80 employees through questionnaires and OPD records over three months. The findings reveal significant insights into the usability, navigation ease, user satisfaction, and data security of the online appointment system, alongside the challenges faced by employees and patients. Recommendations are proposed to enhance system efficiency and patient experience.

Index Terms- Online Appointment System, Patient Satisfaction, Healthcare Management, System Usability, Data Security, Operational Challenges.

I. INTRODUCTION

The shift to digital systems in healthcare has revolutionized patient management and service delivery. This study explores the online appointment system used in a multi-speciality hospital, aiming to estimate its adoption rate, identify challenges, and propose strategies for improvement.

Objectives:

1. To explore the appointment system used in the hospital.
2. To estimate the rate of online appointments.
3. To determine challenges in using the online appointment system.
4. To reduce the time required to book appointments.
5. To enhance the application of the appointment system for ease of use.
6. To increase patient satisfaction by improving the patient experience.
7. To manage hospital appointments efficiently in the OPD.
8. To reduce appointment cancellation rates.
9. To recommend strategies based on identified challenges.

II. METHODOLOGY

- Research Design

This descriptive study examines the online appointment system and its obligations within the hospital setting.

- Research Approach

A quantitative approach was used to gather and analyze data on the appointment system.

- Sample Size

The study includes primary data from 80 employees and OPD records over three months (90 days).

Data Collection

- Primary Data

Data were collected through questionnaires focused on employee perceptions of the online appointment system. The questionnaire included closed-end questions.

- Secondary Data

Secondary data were obtained from literature, journals, websites, and newspapers.

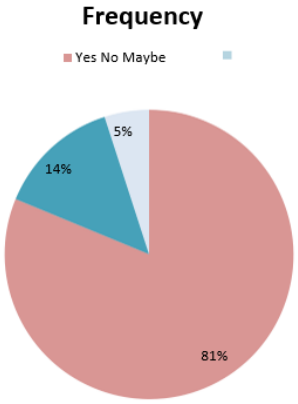
III. DATA ANALYSIS

1. Data analysis of the questionnaire

Table no.1: Do you frequently use Hospital *app* for giving online appointments?

Response	Frequency	Percentage (%)
Yes	65	81.25

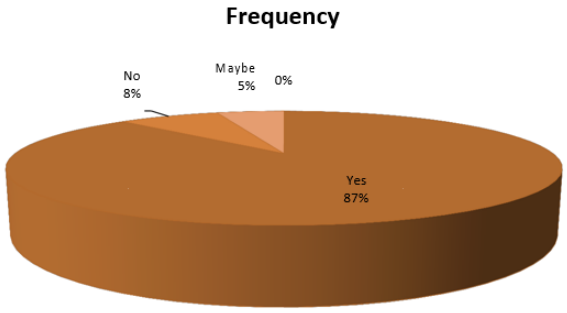
No	11	13.75
Maybe	4	5
TOTAL	80	100



Graph 1: This graph represents the usage of Hospital app for giving appointments among patients by the employees. Based on this graph 65 (81%) employees uses this app. On the other hand, 11 employees (14%) answered negative. 4 employees (5%) answered maybe. Hence, this graph deciphers that most of employees uses Hospital app for giving online appointment.

Table no. 2: Is it easy for you to navigate the online appointment system - Hospital app?

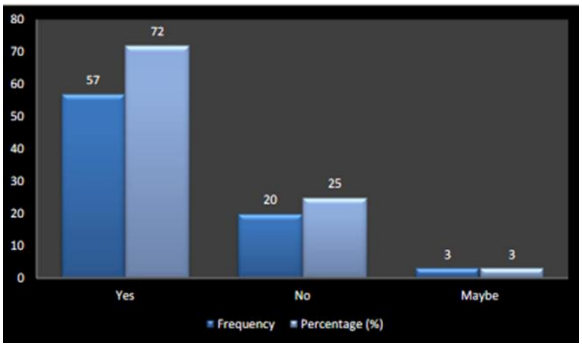
Response	Frequency	Percentage (%)
Yes	70	87.5
No	6	7.5
Maybe	4	5
TOTAL	80	100



Graph 2: This graph represents the navigation of Hospital app among employees in the case of providing an online appointment to the patient. 70 employees (87.5%) employees have answered yes which refers to the easiness of Hospital app in case of navigation as well as communication. 6 employees (7.5%) have answered no and 4 employees (5%) have answered maybe. Henceforth, this graph interprets that navigation easy. But there can be problems in navigating the Hospital app.

Table no.3: Is it for you to navigate the online appointment systems appointment scheduling system on ATHMA?

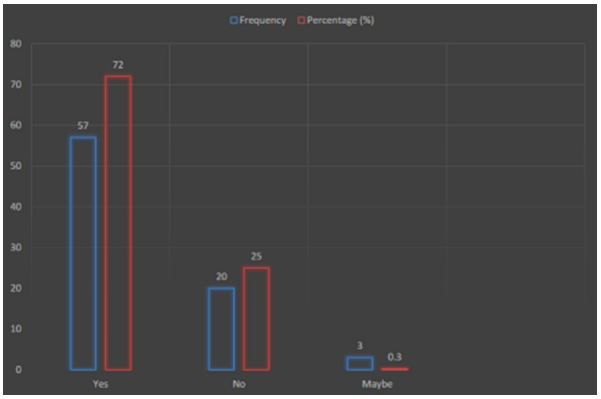
Response	Frequency	Percentage (%)
Yes	55	68.75
No	22	27.5
Maybe	3	3
TOTAL	80	100



Graph 3: This graph represents the navigation of appointment scheduling systems at Athma. Out of 80 employees (100%), 55 employees (68.75%) have answered yes, 22 employees (27.5) have answered no and 3 employees (3%) have answered maybe.

Table No.4: Do you use appointment scheduling system within ATHMA as to provide walk-in appointment?

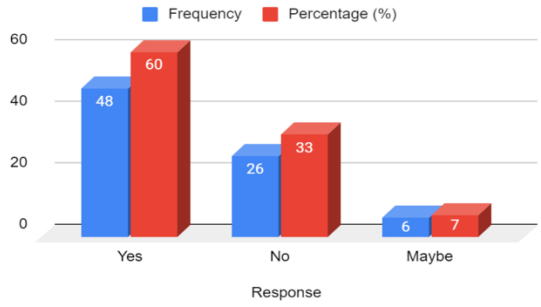
Response	Frequency	Percentage (%)
Yes	57	72
No	20	25
Maybe	3	0.3
TOTAL	80	100



Graph 4: This graph represents the usage of ATHMA among employees in the case of providing an online appointment to the patient. 57 employees (72%) employees have answered yes which refers to using Athma in case of providing appt. 20 employees (25%) have answered no and 3 employees (3%) have answered maybe. Henceforth, this graph interprets that employees also uses ATHMA. But, there can be problems in using the HMIS.

Table no.5: Are you satisfied with overall user-interface and design of the online appointment system of NH care app and athma?

Response	Frequency	Percentage (%)
Yes	48	60
No	26	33
Maybe	6	7
TOTAL	80	100

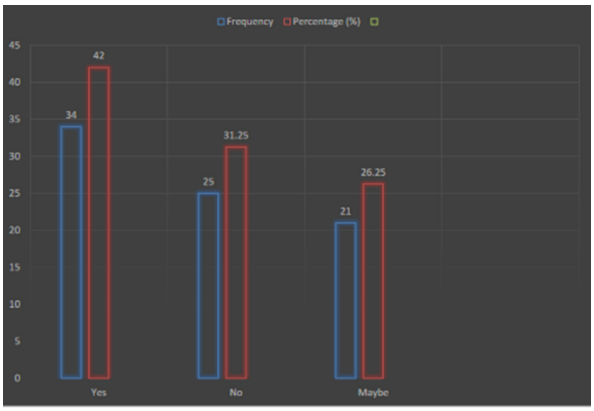


Graph 5: This graph represents the satisfaction level of employees related to the user-interface and design of Hospital app in the case of providing an online appointment to the patient. 48 employees (60%) employees have answered yes which refers to the user friendly feature of NH Care app in case of navigation as well as communication. 26 employees (33%) have answered no and 6 employees (7%) have answered maybe. Henceforth, this graph interprets that user interface is friendly and design is also friendly of Hospital app. But, the negative responses indicate that there can be problems in the Hospital app.

Table no.6: Does the online appointment system meet patients‟ scheduling needs and preferences?

Response	Frequency	Percentage (%)
Yes	34	42

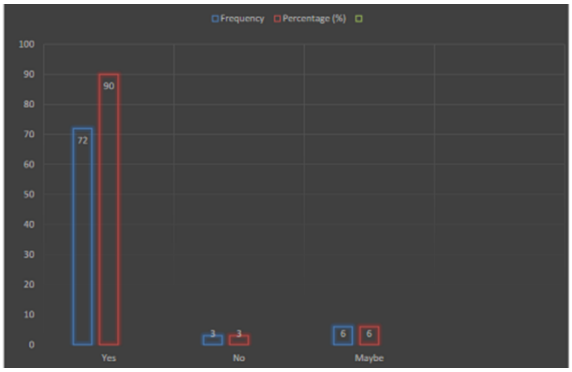
No	25	31.25
Maybe	21	26.25
TOTAL	80	100



Graph 6: This graph represents the question related to scheduling needs and preferences for the betterment of patient in terms of managing appointment.. 34 employees (42%) employees have answered yes which refers to the availability of the feature that meets scheduling needs and preferences for the appointment on daily basis. 25 employees (31.25%) have answered no and 21 employees (26.25%) have answered maybe. Henceforth, this graph interprets that the appointment scheduling needs and preferences based on daily appointment needs. It is in the case of using both Athma and Hospital App.

Table no.7: Do you recommend Hospital App as online appointment system to book online appointments to your known persons & friends?

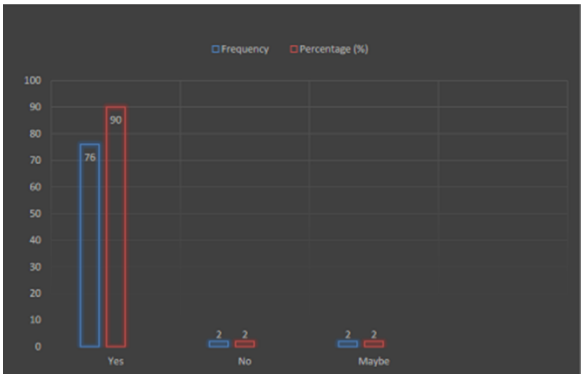
Response	Frequency	Percentage (%)
Yes	72	90
No	3	3
Maybe	6	6
TOTAL	80	100



Graph 7: This graph represents the referral of Hospital app to the known persons, friends, family and patients by the employees. Based on these graph 72 employees (90%) employees have answered yes which refers that the employees will recommend the Hospital app. 3 employees (3%) have answered no and 6 employees (6%) have answered maybe. Hence, majority of the respondents are agreed to recommend the Hospital app that would directly enhance the appointment rate.

Table no.8: Are you satisfied with the level of support and assistance provided when using the Online appointment system (Example: help resources & customer services)?

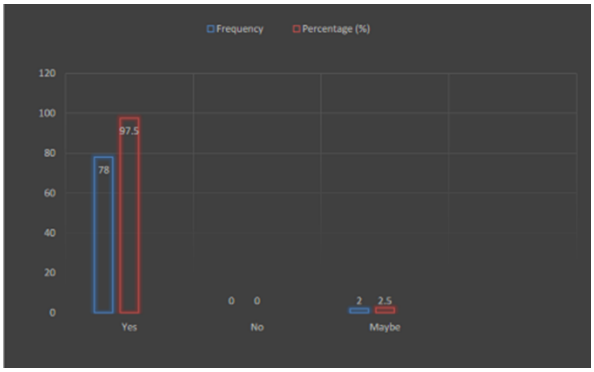
Response	Frequency	Percentage (%)
Yes	76	90
No	2	2
Maybe	2	2
TOTAL	80	100



Graph 8: This graph represents the providing rate needed resources and the assistance that are required when a problem arises within the appointment scheduling system. . 76 employees (90%) employees have answered yes which refers to the assistance level at the right time when it is required. Also, it refers to that the required resources are given to the respondents. 2 employees (2%) have answered no and 2 employees (2%) have answered maybe. Henceforth, this graph interprets that satisfactory level in the case of support and assistance provided when using the online appointment system i.e., help resources & customer services.

Table no.9: Do you think that the online appointment system to be terms of protective patient's personal information and privacy?

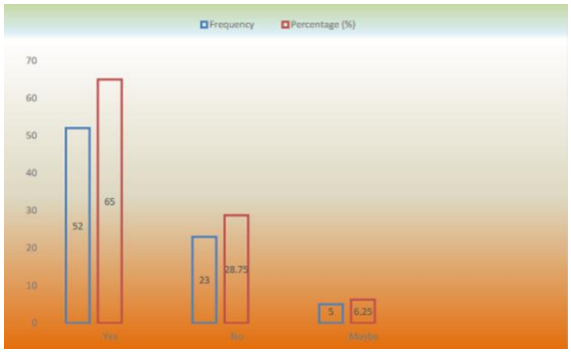
Response	Frequency	Percentage (%)
Yes	78	97.5
No	0	0
Maybe	2	2.5
TOTAL	80	100



Graph 9: This graph represents that the using of Hospital app can protect the patients personal information or not. 78 respondents (97.5%) have answered yes, and 2 respondents (2.5) have answered maybe. Henceforth, this graph interprets that the appointment system is safe and secure to use. It is designed in the way that the data privacy can be maintained along with the maintenance of a huge database.

Table No.10: Do you think that the online Hospital app has higher speed and responsiveness?

Response	Frequency	Percentage (%)
Yes	52	65
No	23	28.75
Maybe	5	6.25
TOTAL	80	100

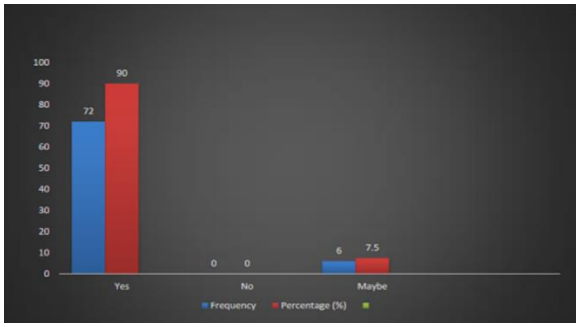


Graph 10: This graph represents the responsiveness of Hospital app with reference to speed. 5 employees (65 %) employees have answered yes. 23 employees (28.75 %) have answered no and 5 employees (6.25%) have answered maybe. Henceforth, this graph interprets that 65% of the respondents have responded that the app has higher speed. On the contrary a sum of 35% of respondents responded negative. Hence, it can be interpreted that not all of the users experienced high speed.

Table no.11: Are you satisfied with the process of booking rescheduling or cancelling appointments through the online appointment system (Athma)?

Response	Frequency	Percentage (%)
Yes	72	90

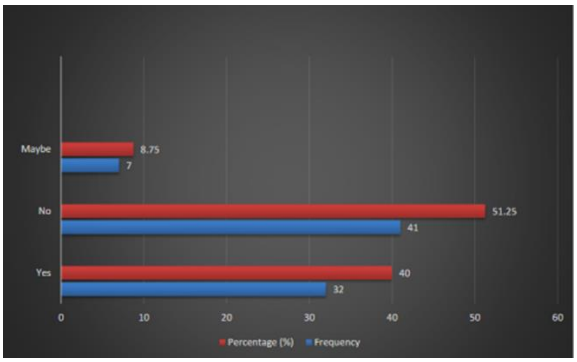
No	0	0
Maybe	6	7.5
TOTAL	80	100



Graph 11: This graph represents the system or rescheduling or cancelling appointments that are used in the Athma. 72 employees (90%) employees have answered yes. 6 employees (7.5%) have answered maybe. Henceforth, this graph interprets that the rescheduling of appointments and cancellation of appointments are easier in both the methods as per the opinion of the respondents.

Table no.12: Do you feel that the online appointment system has helped streamlining appointments scheduling process in your department or team?

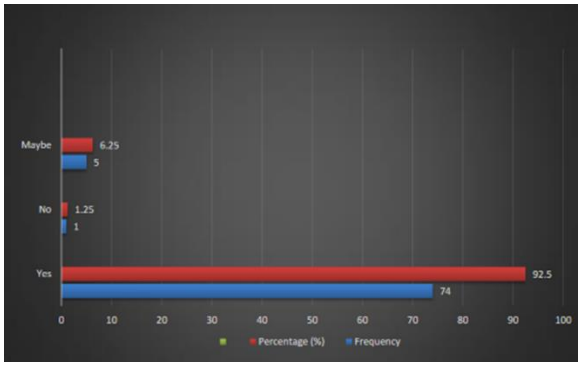
Response	Frequency	Percentage (%)
Yes	32	40
No	41	51.25
Maybe	7	8.75
TOTAL	80	100



Graph 12: This graph represents if the online appointment system has helped streamlining appointments scheduling process in OPD department. 32 employees (40%) employees have answered yes. 41 employees (51.25 %) have answered no and 7 employees (8.75%) have answered maybe. Henceforth, this graph interprets that the negative answers are more than the positive trends. However, this can be interpreted from this graph that the employees have faced numerous problems in arrangement of all appointments along with the online appointments.

Table no.13: Have you received sufficient, training and support to use the online appointment System effectively ?

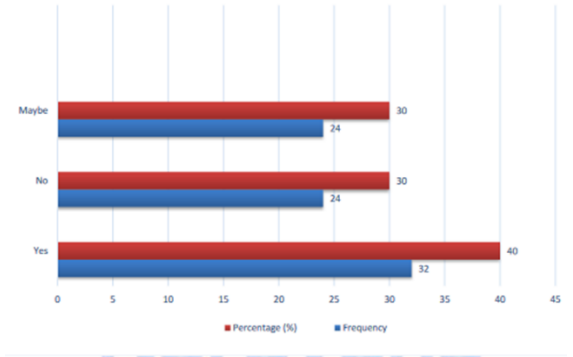
Response	Frequency	Percentage (%)
Yes	74	92.5
No	1	1.25
Maybe	5	6.25
TOTAL	80	100



Graph 13: This graph demonstrates the scenario regarding the training and support of employees. Every employee receives training when he/she has joined the hospital. This graph illustrates that the training about the online booking of appointments that are given to the employees. 74 employees (92.5 %) have responded yes, 1 employee (1.25 %) answered no, and 5 employees (6.25%) have answered maybe. Hence, it can be stated that all of the employees have received training regarding online appointment system.

Table no.14: Did you face any challenges while booking an appointment?

Response	Frequency	Percentage (%)
Yes	32	40
No	24	30
Maybe	24	30
TOTAL	80	100

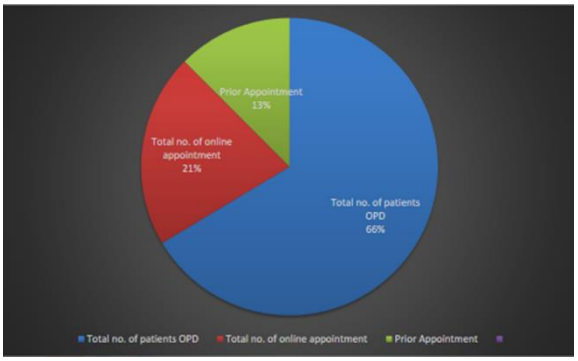


Graph 14: This graph demonstrates the scenario regarding the challenges that are faced by the employees at the time of booking an appointment or managing the patient's visits. Based on this graph, 40 employees (32 %) have responded yes, 30 employees (24 %) answered no, and 30 employees (24%) have answered maybe. Therefore, the negative results are higher than the positive results. Hence, it can be stated that most of the employees have faced challenges during booking an appointment.

2. Data analysis regarding the OPD data

Table No. 15:

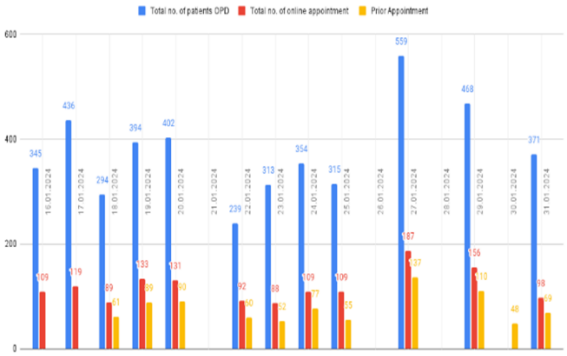
VARIABLES	*Total no. of patients OPD*	*Total no. of online appointment*	*Prior Appointment*
TOTAL	4490	1420	848
Percentage (%)		66.421.06	12.5



Graph 15: This graph represents that the 66.4% is the proportion of the total no. Of patients in the January, 2024. Amongst them only 21% proportion is about the online appointment. On the other hand, 13% data is about the prior appointments.

Table 16:

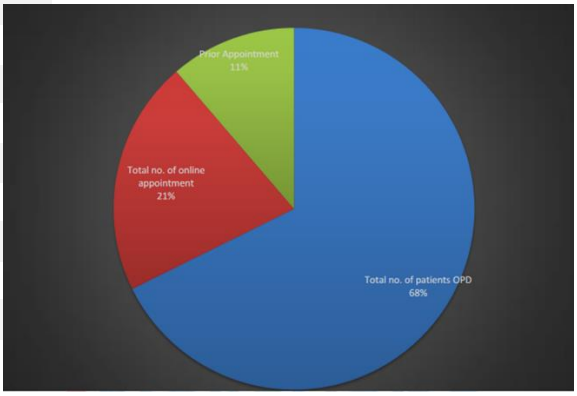
Number of Days	*Date*	*Total No. of Patients*	*Total No. of OPD*	*Prior Appointment*
15 days	15.01.2024			
	16.01.2024	345	109	61
	17.01.2024	436	119	89
	18.01.2024	294	89	90
	19.01.2024	394	133	
	20.01.2024	402	131	60
	21.01.2024			52
	22.01.2024	239	92	77
	23.01.2024	313	88	55
	24.01.2024	354	109	
	25.01.2024	315	109	137
	26.01.2024			
	27.01.2024	559	187	
	28.01.2024			
	29.01.2024	468	156	110
	30.01.2024			48
	31.01.2024	371	98	69
Total		4490	1420	848



Graph 16: This graphical representation is regarding the appointments data of January,2024. this graph demonstrates total no. of patients OPD, total no. of online appointment, and total no. Of prior appointments in the January, 2024. This graph only shows the data of 15 days.

Table no. 17:

VARIABLES	*Total no. of patients OPD*	*Total no. of online appointment*	*Prior Appointment*
TOTAL	10086	3137	1677
Percentage (%)	67.7	21.01	11.3

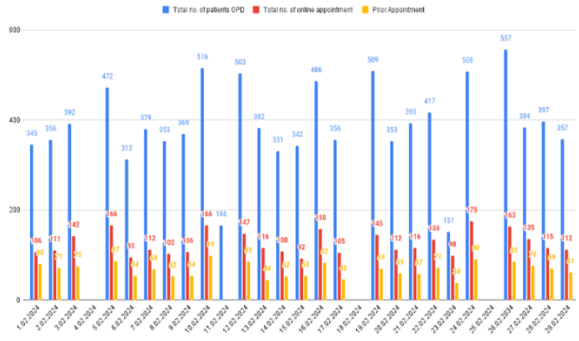


Graph 17: This graph represents that the 63% is the proportion of the total no. of patients in the February, 2024. Amongst them only 21% proportion is about the online appointment. On the other hand, 11% data is about the prior appointments.

Table No. 18:

NUMBER OF DAYS	*Date*	*Total no. of patients OPD*	*Total no. of online appointment*	*Prior Appointment*	
29 days	1.02.2024	345	106	80	
	2.02.2024	356	111	71	

3.02.2024	392	142	75
4.02.2024			
5.02.2024	472	166	87
6.02.2024	312	95	54
7.02.2024	379	112	68
8.02.2024	353	102	52
9.02.2024	369	106	54
10.02.2024	516	166	99
11.02.2024	166		
12.02.2024	503	147	85
13.02.2024	382	116	44
14.02.2024	331	108	52
15.02.2024	342	92	53
16.02.2024	486	158	83
17.02.2024	356	105	46
18.02.2024			
19.02.2024	509	145	69
20.02.2024	353	112	59
21.02.2024	393	116	57
22.02.2024	417	134	71
23.02.2024	151	98	38
24.02.2024	508	175	90
25.02.2024			
26.02.2034	557	163	85
27.02.2024	384	135	76
28.02.2024	397	115	69
29.02.2024	357	112	61
Total	10086	3137	1677

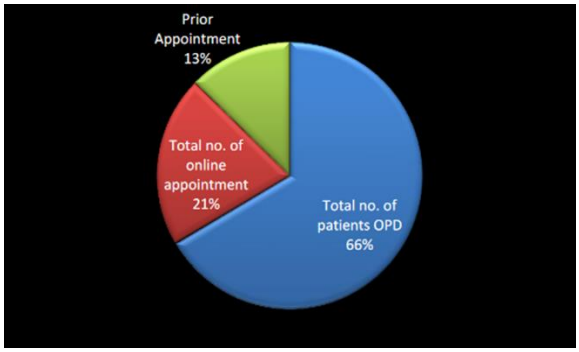


Graph no.18: This graphical representation is regarding the appointments data of February, 2024.This grah demonstrates totall no. of patients OPD, total no. of online appointment, and total no. Of prior appointments in the February, 2024. this graph only shows the data of 29 days.

Table No.19:

Variables	*Total No. of Patients OPD*	*Total no. of Online Appointment*	*Prior Appointment*
Total	11398	3575	2169

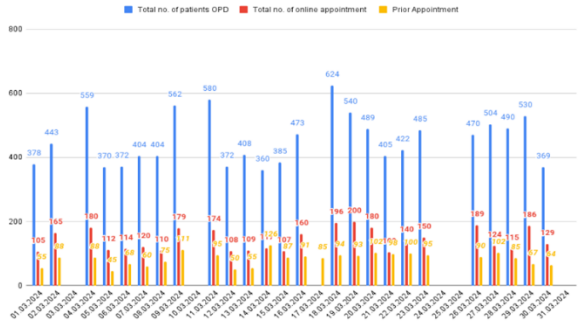
Percentage %	66,5	20.80%	12.7



Graph19: This graph represents that the 66% is the proportion of the total no. of patients in the March, 2024. Amongst them only 21% proportion is about the online appointment. On the other hand, 13% data is about the prior appointments.

Table No.20:

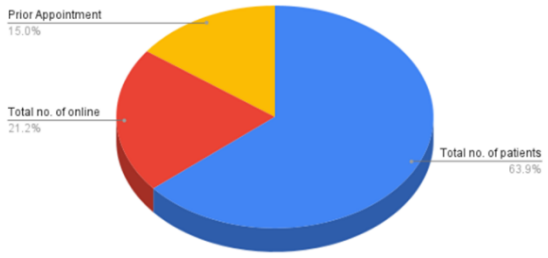
NUMBER OF DAYS	*Date*	*Total no. of patients OPD*	*Total no. of online appointment*	*Prior Appointment*
31 days	01.03.2024	378	105	55
	02.03.2024	443	165	88
	03.03.2024			
	04.03.2024	559	180	88
	05.03.2024	370	112	45
	06.03.2024	372	114	68
	07.03.2024	404	120	60
	08.03.2024	404	110	75
	09.03.2024	562	179	111
	10.03.2024			
	11.03.2024	580	174	95
	12.03.2024	372	108	50
	13.03.2024	408	109	55
	14.03.2024	360	117	126
	15.03.2024	385	107	87
	16.03.2024	473	160	91
	17.03.2024			85
	18.03.2024	624	196	94
	19.03.2024	540	200	93
	20.03.2024	489	180	102
	21.03.2024	405	103	98
	22.03.2024	422	140	100
	23.03.2024	485	150	95
	24.03.2024			
	25.03.2024			
	26.03.2024	470	189	90
	27.03.2024	504	124	102
	28.03.2024	490	115	85
	29.03.2024	530	186	67
	30.03.2024		129	64
	31.03.2024		216	
	Total	11398	3572	9



Graph 20: This graphical representation is regarding the appointments data of March, 2024. This graph demonstrates total no. of patients OPD, total no. of online appointment, and total no. Of prior appointments in the March, 2024. This graph only shows the data of 31 days.

Table No. 21:

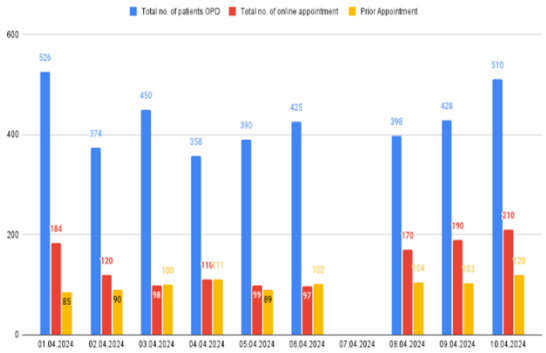
Variables	*Total No. of Patients OPD*	*Total no. of Online Appointment*	*Prior Appointment*
Total	3859	1278	904
Percentage %	63.9	21.2	15



Graph no 21: This graph represents that the 63.9% is the proportion of the total no. of patients in the April, 2024. Amongst them only 21.2% proportion is about the online appointment. On the other hand, 15% data is about the prior appointments. This graph represents only 10 days data in April month.

Table No.22:

NUMBER OF DAYS	*Date*	*Total no. of patients OPD*	*Total no. of online appointment*	*Prior Appointment*
10 days	01.04.2024	526	184	85
	02.04.2024	374	120	90
	03.04.2024	450	98	100
	04.04.2024	358	110	111
	05.04.2024	390	99	89
	06.04.2024	425	97	102
	07.04.2024			
	08.04.2024	398	170	104
	09.04.2024	428	190	103
	10.04.2024	510	210	120
TOTAL		3859	1278	904



Graph no.22: This graphical representation is regarding the appointments data of April, 2024. this graph demonstrates total no. of patients OPD, total no. of online appointment, and total no. Of prior appointments in the April, 2024. This graph only shows the data of 10 days.

RESULTS AND OBSERVATION

Online appointment systems have revolutionized the way in businesses and professionals in the healthcare industry to manage their schedules and interact with clients. These systems provide a convenient platform

for scheduling appointments, reducing the need for phone calls and manual coordination. Here's a detailed discussion on the various aspects of online appointment systems:

Convenience: One of the most significant benefits of online appointment systems is convenience.

Clients can schedule appointments at any time of the day, without being restricted by business hours.

This flexibility caters to the needs of modern consumers who value convenience and efficiency.

Time-saving: Online appointment systems save time for both clients and service providers. Clients can quickly book appointments without having to wait on hold or navigate through complex phone menus. On the other hand, businesses save time by automating the appointment scheduling process, allowing staff to focus on more critical tasks.

Accessibility: These systems enhance accessibility for clients with disabilities or those who face barriers to traditional appointment scheduling methods. Online platforms can be designed to be accessible to individuals with visual or hearing impairments, ensuring equal access to services.

Reduced no-shows: Online appointment systems can help reduce the number of no-shows by sending automated reminders to clients before their appointments. This proactive approach minimizes missed appointments, maximizes productivity, and improves overall client satisfaction.

Resource optimization: By streamlining the appointment scheduling process, businesses can optimize their resources more effectively. They can allocate staff, equipment, and facilities based on scheduled appointments, minimizing idle time and maximizing revenue potential.

Data-driven insights: Online appointment systems generate valuable data that businesses can use to gain insights into client behaviour, preferences, and trends. Analyzing this data enables businesses to make informed decisions about their operations, marketing strategies, and service offerings.

Integration with other systems: Many online appointment systems offer integration with other software applications, such as customer relationship management (CRM) systems, payment processors, and marketing platforms. This seamless integration enhances efficiency and provides a holistic view of client interactions.

Security: Security is a crucial aspect of online appointment systems, especially concerning the protection of client data. Implementing robust security measures, such as encryption and secure authentication protocols, ensures the confidentiality and integrity of sensitive information.

RECOMMENDATIONS

1. Improve System Navigation and Speed: Enhance the user interface and optimize the system for better performance.
2. Increase Training and Support: Provide continuous training and support to ensure effective system use.
3. Address Scheduling Challenges: Develop strategies to streamline appointment scheduling and reduce cancellations.
4. Enhance Data Privacy Measures: Maintain and upgrade data security protocols to protect patient information.

CONCLUSION

Online appointment systems offer numerous benefits for businesses and clients alike, including convenience, time savings, accessibility, and resource optimization. By leveraging these systems, businesses can enhance efficiency, improve customer satisfaction, and stay competitive in today's digital age.