IST 654

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PIECES AND VALUE STREAM MAPPING

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Meeting Venue: Hinds Hall Room 216

About HCG

Health Care Group (HCG) is an organization that plans, develops and organizes wellness initiatives for patients. They track various wellness initiatives, their success in terms of patient participation, satisfaction and engagement.

What HCG does?

Health Care Group organizes various events such as seminars, workshops, gym sessions, yoga sessions, webinars etc. that help customers improve their health. They track the customer health information before the event and after the event. This is done over a period of time thus helping them analyze the success of the event in terms of the patient participation, satisfaction and engagement.
The processes that are followed currently are:

- HCG receives customer health information through the medical tracking system. The system provides HCG with information on the various problems faced by customers, their health information like blood pressure, health conditions, blood sugar level etc.

- HCG collects the data that it receives from the medical tracking system and interacts with various stakeholders on the feasibility of organizing events targeting specific customer, with a goal to improve their health and well being.

- HCG then plans various wellness initiatives such as Yoga sessions, Health Seminars, Workshops, Webinars, Marathons, Games, Gym training and various other similar activities to help customers.

- HCG then sends out emails to the customers and publicizes the event through various platforms on the upcoming events to all the customers.

- The customer's register for various events depending on their availability and interests.

- Depending on the responses received from the customers, HCG decides to go ahead with the event, if more than 15% of the customer's register for the event.

- On the day of the event, the customers reach the event venue and attend the session. The attendance of the customers is collected by the HCG event management team. This is done manually via excel sheets.

- The customers have to fill two survey forms. One prior to the event and one after the event. These contain basic questions related to their health, improvements in health, how they found the seminar etc.

- After each event, the organization thus collects the individual forms filled by each representative during the event, the attendance excel sheet and compiles them together in a systematic manner.

- Each representative then sends the data that they collect to their leads through outlook via mails. The team lead then manually compiles all the received data and sorts them according to the date and time.

- The organization then sends further survey questions through emails to the customers after the event. These contain another set of questions that help the organization understand the health of customers after the event.

- All the data received is then analyzed and the success of the event is calculated in terms of the responses of the patient, their satisfaction and engagement.

- The organization also tracks the health of the customers after the event. They then compare the health before the event and after the event. This also helps in analyzing the success of the event.

Problems with the current process?

The current wellness initiatives tracking system is manual and consumes a lot of time. The wellness initiative team representatives collect the data through excel sheets and ask customers to fill out paper based survey forms. The sheets are sent to the team leads via outlook. The team lead then needs to manually sort the data that it receives. All the above steps are time consuming, costly and inefficient.

A PIECES (Performance, Information, Economics, Control, Efficiency and Service) analysis helps to identify the potential benefits of the proposed system over the current system.

P – PERFORMANCE

Performance of the current system needs to be analyzed, since performance is one of the key components of any system. The performance of the system is analyzed based on the how well the system handles the process of the tracking of claims.
The performance of a system is calculated in terms of two parameters:

a) **Throughput:**
   Throughput is defined as the amount of material that passes through a system or process. The problem with the current system is that it relies on manual update and the handling of data by the data specialists.

PROBLEMS –

The current system requires a lot of manual work due to the following reasons:

- The event organizing representatives manually enter each customer's information at the beginning of the event in excel sheets.
- Each representative has to maintain and be careful of individual copy of the excel sheet.
- The sheet is sent daily to their supervisors at HCG organization through mails.
- The representatives manually set reminders for each sheet to be sent.
- The representatives have to keep these excel sheets securely to prevent the customer data from getting leaked.
- The supervisors/ team lead has to manually go and login into their emails and check if all the information received on the mail is correct and up to date.
- The supervisor/team lead has to manually combine all the content received from the various representative and generate reports and analyze the data.

b) Response Time

Response time is defined as the total amount of time it takes for a system or process to respond to a request for service. It is the amount of time or the delay caused for the response to be generated.

PROBLEMS –

In the current system the following are the tasks where delays can be caused in the process:

- Time delay in manually entering the customer data in each excel sheet
- Time delay in sending the sheet to the supervisor/ team lead
- Time delay between the day of the event and the day on which analysis of the event data actually takes place.
- Time delay in manual checking and verification of the data received from the representatives and analyzing the data.

PROPOSED SYSTEM SOLUTION –

The proposed system will automate the manual process which will help reduce the throughput and the response time as follows:

- The system would have a super card that each customer uses to swipe in during the event. The customer details would be recorded instantaneously.
- Every event would have an online form connected. Once the customer swipes his card at every event, details such as attendance, gym session details, details entered during various events would be directly linked to his id. For example, when a user enters the gym his workout details would be linked to the customer id through the card that he swipes.
- The system will thus reduce the time an employee takes to enter the details of the customer.
- They data received will directly be available to HCG on their portal, thus eliminating the time spent on using outlook and sending emails.

- The automated system would also have algorithms that would be used to generate various kinds of reports thus further reducing time delays.

I – INFORMATION

Information deals with how the current process handles data. It involves how data enters, how data is sent out and how data is stored while processing. The following are the problems with the Information in the current system:

a) Input: Input refers to the process of how the customer information is getting captured during the initial stages of the process.

PROBLEMS –

- Time taken in capture:
  The information needs to be manually filled in multiple sheets by every representative and then mailed to the lead/supervisor. This process is time consuming as it involves a time delay in the information being received by the supervisor.
- Redundancy in capture:
  The customer information is stored in an excel sheet. The data then needs to be again manually entered into the system for every individual customer thus causing a redundancy
- Errors in capture:
  The information is captured by the representatives. Also the data that is sent to the lead/supervisor is then updated in the system. Thus the final data that is getting saved directly depends on the accuracy of the data that the supervisor saves initially. There is a possibility of data being entered incorrectly due to a human error on their part.

b) Output: Output refers to the how the data is flowing out of the process.

PROBLEMS –

- Error in Output:
  The customer information that is filled into the system at the end of every cycle has a direct dependence on the accuracy of the information that is manually entered by the representatives.

c) Storage: Storage refers to how the data is stored and the tasks involved in the procedure of storing the data.

PROBLEMS –

- Redundancy in storage:
  In the current process, the data is stored both in excel sheets initially. Further, after the event, the customer information is sent to the lead who manually enters the data received into the system. Thus the same data is getting stored twice. Thereby resulting in a redundancy in storage of information

- Inaccuracy of Stored Data:
  Given that entry and updating of data relies solely on manual labor, there are high chances that the data being stored has errors in one or the other locations

PROPOSED SYSTEM SOLUTION –
The proposed automated system shall enhance the way in which information is gathered, captured and stored. This is done in the following ways:

- The proposed automated solution shall reduce the overall amount of data replicating and manual entry that needs to be done. The automated system will track the customer information much more efficiently.
- The proposed solution would have a central database system that would track the various information of all the customers that participated in each event. Thus making storage convenient and at a central location.
- The proposed system would reduce the risk due to errors while entering the customer information. Also the system would have several validations to make sure that the data being entered is correct, making it much easier to track errors.
- Editing data also becomes much more convenient in the proposed system as compared to the current system where, data needs to be re entered manually, mailed and notified to the lead for editing.
- Generation of reports also becomes much easier using the new system as it would eliminate the manual process of generation of reports.
- The system shall also have user access levels to make sure that the flow of information takes place only to secure accounts, as compared to the current system where securely sending data and storing it becomes difficult.

C – CONTROL

Control refers to the how the information flow is controlled and facilitated efficiently in a process. The current system requires information to flow across various stages. Thus control of information plays a very important part.

PROBLEMS –

- Criminal Activity:
  In the current system the process involves manual entry of data. In a manual system there is no control over the entry of data and keeping it in check. This can easily give rise to criminal elements in the organization.

- Difficulty to trace:
  In the current system, it is difficult to trace an error back to its source. This gives leverage to criminal elements to violate the system and makes the system vulnerable to incorrect and tampered data.

- Prone to Errors:
  The current system is prone to error of critical customer data due to manual data entered by representatives. This may cost customers in terms of customer relations, satisfaction and also cause deviation in the success criteria since the success criteria of the organization is heavily linked to the accuracy of information received.
- Insufficient Control:
  HCG has no control over the format, consistency of data entered. The data can be sent to any unauthorized person incorrectly. Also, the data can be accidently lost by the representatives. The paper based sheets have a risk of getting lost.

PROPOSED SYSTEM SOLUTION –

The proposed system gives more control over security and errors in the following ways:

- The system contains a central database and access would be given only to authorized representatives.
- Backup of the database would ensure minimum risk due to accidental deletion.
- Changing or updating data in the system would be coupled with notifications being sent. This improves the visibility.
- The system would be secure which assures customers that their data is handled with privacy and security.

E – EFFICIENCY

For any system to be successful, it must be efficient. Efficiency is one of the key factors to measure the performance of a system. It refers to analyzing a system on the basis of people, machine or computer waste.

PROBLEMS –

The current system is inefficient due to the following reasons:

- The customer data is entered redundantly in excel sheets by the representatives.
- Unnecessary effort is being spent on sending this data to the supervisors and team leads through mails. This is an extra step that can be avoided.
- If changes to the data need to be made, the representative that had entered the specific customer's details needs to contacted. Otherwise there could be two responses for one user.
- Also, as discussed in the previous section, the current system involves a lot of time delays and redundancy in the input, output and storage process.

PROPOSED SYSTEM SOLUTION –

The proposed system helps improve the efficiency in the following ways:

- The proposed system eliminates the unwanted data entry, manual processing and redundancies.

- The proposed system would contain an online portal with the information being entered linked to the customer card. Thus once the customer has swiped the card, the details that he enters gets directly linked to the respective account thereby eliminating the step of sending emails.
- If the customer wishes to update data, he can do so immediately. The updated data would be saved by the system and the previous entry would be replaced by the new one.
- The number of excel sheets that are required to be maintained would be greatly reduced. Thereby improving the storage efficiency.
- The proposed system would eliminate redundancy and time delays as described in the previous sections.

S – SERVICE

Service is another important aspect to analyze the performance of a system. It refers to analyzing the system in terms of its accuracy, consistency, reliability, learning potential, flexibility, coordination etc. The current system has various problems that are mentioned below.

PROBLEMS –

- There is a high possibility that a customer's details might be missed due to manual update.
- The representatives and the leads need to coordinate to make sure that the process runs effectively.
- The process of entering information accurately depends on the efficiency of the representatives. There is a sense of insecurity amongst customers to reveal information to representatives who are inexperienced and not knowledgeable.

PROPOSED SYSTEM SOLUTION –

The proposed system helps eliminate the above problems as follows:

- The automated system would ensure that the customer information entered is correct and accurate
- The proposed system are fast. Once the data is entered into the system, it would be available for the team lead to access it immediately thereby eliminating the middle stage of having to manually send emails and coordinate amongst members.
- The proposed system helps achieve high level business objective by streamlining the process. The data entered would be over the internet, thereby making the process fast, efficient and accurate.

The major benefit of the new automate system is that it offers the business a platform of scalability. An automated system that is scalable can be used to include more events, additional data as and when needed from the customers, filtering on the basis of the type of customers that need to be targeted in future. And all this can be done with effectively very less additional costs.

E – ECONOMY

HCG faces loses due to manual processes every month. Automating the system can reduce the expenditure for HCG, thereby helping them not only improve the processes as discussed in the above sections, but also in maximizing their profits.

Current Cost Scenario:

Below is the table that describes the value/unit of the attribute that is being measured.

Description	Value/Unit
Product	Tracking customer details
Average number of customers per event	100 customers
Average number of representatives required to save customer data and recode attendance	8 representatives
Working hours for an event	8 hours
Average number of events in a week	1 event
Average number of events in a month	5 events
Number of employees required for collecting and processing data	5
Hourly rate for Data entry	$15
Hourly rate for Collecting and processing data	$20
Average extra time per event(Data Entry)	5hrs
Average extra time per event(Processing)	5hrs
Extra time charge	Additional $5 per hour
Number of computers required	14
Monthly computer maintenance cost	$10/computer
Miscellaneous cost per event (e.g. Paper, stationery, printing of surveys etc.)	$50

Process Cost Scenario:

S.R No	Entities	Current State	Future State	Benefits Of Future State	Current Expenditure per Event ($)	Monthly Expenditure ($)	Future Monthly Savings ($)
1	Data Entry	8 employees	2 employees	6 employees	8*8*15 = 960	960*5 = 4,800	4*8*15*5 = 2400
2	Collection and Processing	5 employees	3 employees	2 employees	5*8*20 = 800	800*5 = 4,000	2*8*20*5 = 1600
3	Data Entry Extra Time	25 hrs/month	5 hrs/month	20 hrs/month	25*5 = 125	125 * 5 = 625	20*5*5 = 500
4	Collection and Processing Extra Time	20 hrs/month	3 hrs/month	17 hrs/month	20*5 = 100	100 * 5 = 500	17*5*5 = 425
5	Maintenance of Computers	14 computers	4 computers	10 computers	NA	14*10 = 140	10*10 = 100
6	Miscellaneous charges	$50 per event	$10 per event	$40 per event	50	50 * 5 = 250	40 * 5 = 200
	TOTAL				2,035	10,315	5,225

Justification for Future State:

1. The future state will require only 2 employees for data entry:
   This is because, in our proposed system every customer will be given smart cards using which he will be able to swipe in during every event. His attendance will be automatically sent once he swipes in.

2. The future state will require only 3 employees for collection and processing:
   This is because, in our proposed system once the customer information swipes his card into any event at the time of entry, the information that is recorded is linked to their card that they use to swipe in and is available to the data collection team directly since the process is automated.

3. Maintenance of Computers:
   The number of computers will be reduced to 4. These 4 computers will also be used to verify the information and resolve issues if any.

4. Miscellaneous Charges:
   This includes charge of Paper, printing, stationery, surveys forms etc. As the system is an automated one, the charges spent here per event will drastically reduce.

   Thus, as observed automation leads to a significant decrease in the number of personnel required to monitor the changes in the client system.

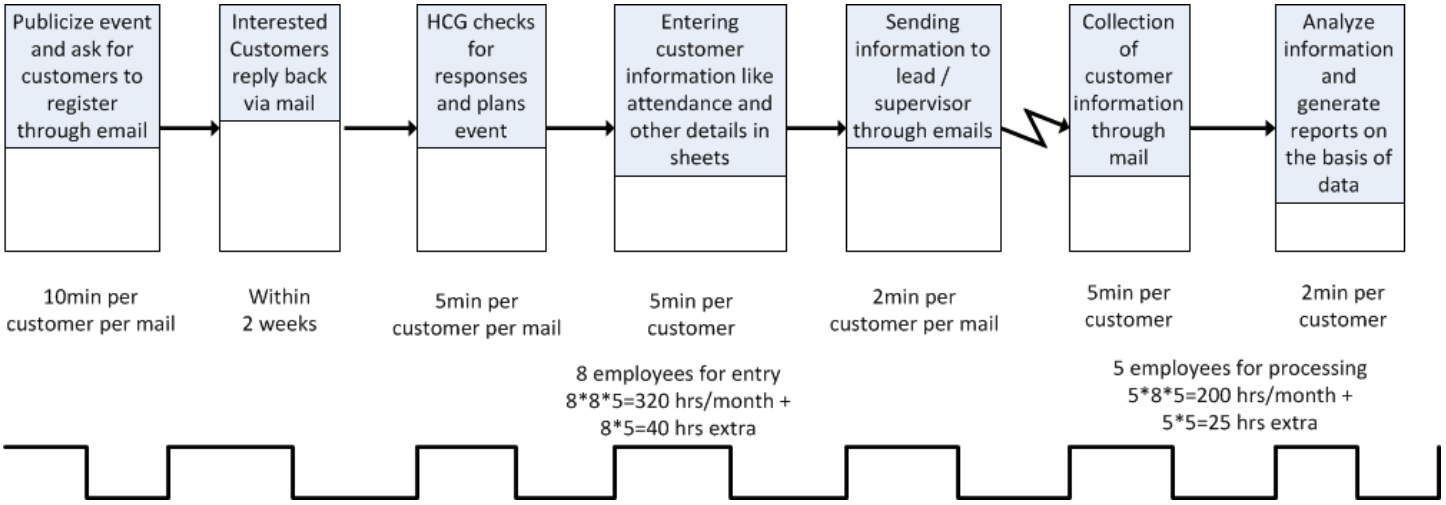
   NOTE:
   The proposed system would involve the use of modern technology like use of fit-bit to track customer fitness, iPad for customers to fill on the spot event questions and surveys, creating swiping super cards and installation of machines to read them and the development cost of the application.
   The costs mentioned above are one time costs.

Thus,

Total Monthly Saving = $ 5,225

In terms of Percentage = $\frac{(10315 - 5225)}{10315} \times 100 = 49.34\ \%$

CURRENT STATE DIAGRAM:

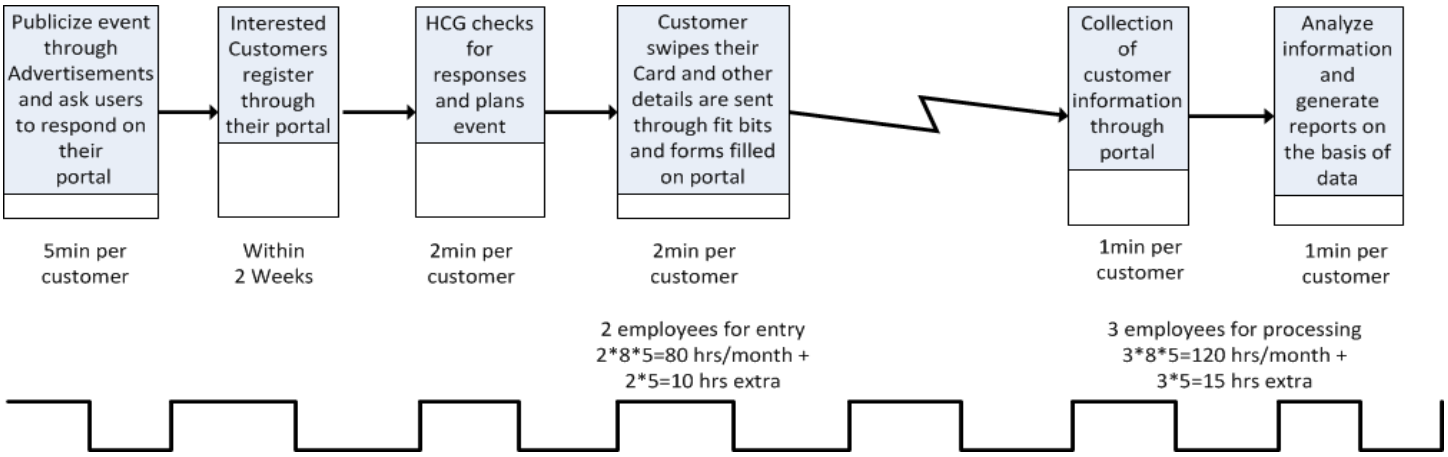


For one customer data to go through the process:

- Creating mail, thinking about content, typing and formatting=10min per customer per mail
- Reading the received customer response through mail= 5mins per customer per mail
- Entering customer detail in excel = 5mins per customer
- Sending customer sheet through mail= 2min per customer (As sheet contains 20 customer data)
- Checking received information through mail and combining data= 5min per customer
- Analyzing information received and generating reports=2mins per customer

Total time Required: **29 minutes / customer**

FUTURE STATE DIAGRAM:



For one customer data to go through the process:

- Creating, thinking about content and broadcasting on portal=5min per customer
- Reading the received customer response through portal (Statistical data) = 2mins per customer
- Entering customer detail through card swipe = 2mins per customer
- Sending customer data through portal= 1min per customer
- Checking received information through portal= 1min per customer
- Analyzing information received and generating reports=0.5mins per customer

Total time Required: **11.5 minutes / customer**

Thus, for a period of 1 month, (considering 5 events were held) from the above two state diagrams we can conclude the following:

a) The comparison between the current state and future state diagram clearly shows a reduction in the number of workflow elements over a span of one month.

b) The portal makes it much easier for HCG to make decisions reducing the delay time.

c) Devices such as fit bits, health monitor systems, card swipe technology increases the efficiency and reduces the time lag as shown, thereby reducing the employees required from 8 to 2.

d) The process of analyzing data and report generation becomes much faster as the data is readily available in the future system.

If we compare the metrics of time and cost the future state requires less amount of time to process transactions.

S.R No	Entities	Current State Time	Future State Time	Current Monthly Expenditure ($)	Future Monthly Expenditure ($)
1	Data Entry	8*8*5 = 320 hrs/month	2*8*5 = 80 hrs/month	320 * 15 = 4800	80 * 15 = 1200
2	Collection and Processing	5*8*5 = 200 hrs/month	3*8*5 = 120 hrs/month	200 * 20 = 4000	120 * 20 = 2400
3	Data Entry Extra Time	8*5 = 40 hrs/month	2*5 = 10 hrs/month	40 * 15 = 600	10 * 15 = 150
4	Collection and Processing Extra Time	5*5 = 25 hrs/month	3*5 = 15 hrs/month	25 * 20 = 500	15 * 20 = 300
	TOTAL			9,900	4,050

Thus, the monthly cost reduces from $ 9,900 to $4,050.

And the per Event Cost reduces from $ 1,980 to $ 810.

General Performance Metrics

Performance Object	Dimension	Indicator
Process Performance Response Time	Efficiency (Response Time)	Time taken/event
Process Performance Throughput	Efficiency (Throughput)	Customer data/hour
Information Need	Error In saving customer data	Errors /event
Storage	Storage space requirements	Space required /event
Process Cost	Cost required for an event	Amount spent/event
HR Required	Human Resource needed	Employee /event
Customer Satisfaction	Complaints	Complaints /event

Assuming that the conditions are the same for the current and proposed system that is number of events, number of customer data being handled per day etc. the following performance comparisons can be made:

Performance Metric	Current System	New System
Efficiency(Response Time)	~29 min	~11.5min
Efficiency (Throughput)	~2 customer/hour	~5 customer/hour
Information Need	Out of scope	Out of scope
Storage Need	Out of scope	Out of scope
Process Cost	$1,980	$810
HR Required	13 employees	5 employees
Customer Satisfaction	More complaints since there could be mistakes and errors caused by representatives during filling of information	Fewer complaints as customer has control over the data being sent to the system.

Thus, our future system provides various benefits which can be described as follows:

Performance Object		Dimension	Indicator	Benefits of Future System
PROCESS	Data Entry, Communication and Error handling	Quality	No of errors, missed data, incorrect data in the customer data gathered	The future system would have lesser errors as the manual process is replaced by an automated one thus eliminating human errors
		Time and Efficiency	Time required to enter, search and update data in the future system/ Time	The future system involves eliminating time in manually entering data, sending

			required to enter, search and update data in the current system	emails, filling excel sheets, compiling data etc.
		Resource	No of resources involved in the future system/ no of resources involved in the current system	The resources required in the future would be lesser than that required in the current system as shown above.
PRODUCT	Better data Privacy	Quality	Quality of preserving and data handling in terms of security, leaks and violations	The current system entirely depends on the employees to make sure that they do not misplace documents that could possibly lead to leaks. The future system handles data in a secure manner.
		Time and Efficiency	Time required to make sure that the data being processed and handled is done securely.	In the current system each employee has to spend time on making sure that the data handling is secure. The future system does the same activity in an automated way thus reducing time.
	Automated Data Gathering	Quality	No of errors, missed data, incorrect data in the customer data gathered	The future system shall have lesser errors because the manual process of data entry is replaced by an automated one thus eliminating human errors
		Time and Efficiency	Time required to enter, search and update data in the future system/ Time required to enter, search and update data in the current system	The future system involves eliminating time in manually entering data, sending emails, filling excel sheets, compiling data etc. This makes data gathering much efficient and faster
	Convenience in Notifying Customers	Quality	No of errors, missed customers, incorrect data customers being notified	In the future system the notifications provided to the customers would be on their portals, where they just need to login. This makes the quality in delivering information much efficient.

		Efficiency and Convenience	Information being delivered to the customer and convenience in terms of user interaction	In the future system, as the notifications would be provided through the portal, instead of checking mail every time, customers would find it convenient as they have one location where they can find everything they need. Also, they do not have to worry about problems like email getting changed or disabled.
	Event gathering information	Time and Efficiency	Time and ease of gathering data in the future system/ Time and ease of gathering data in the current system	In the future system the event data gathering is automated trough use of fit bits, surveys on portals all linked to customer swipe cards thus making it much faster and efficient than current system. Also the delay in sending data and relying on manual process would be eliminated.
DELIVERABLE	Dashboard	Quality	No of errors, missed customers, incorrect data in future systems / No of errors, missed customers, incorrect data in current systems	In the future process, the user would have a dashboard where he can view and complete surveys, track his progress after every event that he takes part in and view stats of his health. Employees would also have a dashboard to gather all event data, statistical reports and view customer details.
		Time and Efficiency	Time and ease of gathering and processing data in the future system/ Time and ease of gathering and processing data in the current system	The presence of dashboard would reduce the time involved in manually sending mails, updating user data, view survey responses, updated customer health data and communicating with customers.

	Reporting	Quality	No of errors, missed customers, incorrect data in future systems / No of errors, missed customers, incorrect data in current systems	The future automated system and would generate reports periodically and efficiently as it would eliminate the possibilities of manual mistakes.
		Time and Efficiency	Time and ease of gathering data in the future system/ Time and ease of gathering data in the current system	The future automated system would also generate the reports much faster and would make adjustments for new incoming data efficiently and quickly.