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**Supporting workflow in the healthcare system**

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**Introduction**

In the healthcare industry, it’s important to use time, money, human resources, and materials to the fullest. With this rapidly changing regulatory requirement and a critical life-saving mission, healthcare organizations should constantly attempt to provide high-quality services along with managing resources and controlling costs as effectively as possible. One way to keep up with this is via gap analysis, the assessment of our performance to identify the differences between our current state and where we want to be. It is intended to identify gaps, the reason behind the gaps in the organization, and cast a light on why these gaps exist helping us focus better on resources and energy on identified areas so that we can improve them. This paper covers the workflow analysis of the issue I have selected.

**Workflow issue**

The workflow issue I will be addressing in this assignment is the issue that arises with a poor EHR interface. When it is difficult to see or when there is confusion in navigation in an EHR interface, when we must click a million times to go to a certain screen, it creates frustration and takes all the time that could have been given in patient care. According to Binariks.com, Out of ten clinical personnel, seven reported burnouts related to EHR integration, Clinician exhaustion increases the chances of making mistakes, therefore convenient EHR screen design and user interface create a significant impact. The research done by AMA found that a one percent point increase in EHR usability scores decreases clinicians burnout by 3%.

**Workflow issues tied to EHRs/Objective**

EHR and interface are tied to each other. An interface plays a crucial role in an EHR system because it connects different components of a system. The interface is both a visual and operational design of an EHR that stores and manages patient health data, integrating various tools to assist healthcare teams. A good interface is needed for users to navigate these tools effectively. Poor interfaces can frustrate users and slow down the process, so it's crucial to prioritize the design principle of an interface that enhances user experience and usability. The interface serves as a medium between various EHR components. The main purpose of electronic health record solutions is to facilitate collaboration among healthcare teams by integrating various tools. A clear interface is important for users to work on these tools effectively.

**Workflow issue IOM’s six aims of care**

According to McGonigle and Mastrian, EHR was brought as a solution to achieve the goal of improving quality care while controlling cost because the healthcare system of the U.S. was facing enormous challenges.

IOM has outlined six aims for redesigning healthcare systems. Healthcare systems should be patient-centered, timely, effective, efficient, equitable, and safe. To achieve these aims, we can organize an approach by dividing the six aims into three levels that govern the design process. (Battles, 2006) A good interface can help us achieve these three levels.

Level 1: Patient-centered interface can be designed which currently influences health care. An interface can be designed in such a way that is easily understood and interpreted by the patient. For instance, the Patient portal with interactive and personalized tools, that have information more relevant to patient needs can be achieved through interface.

Level 2: A good interface is always secure. Security should be a priority when designing an interface. Poor interface can cause cognitive overload and fatigue, the users might have to process a lot of information and remember too many steps to complete the task leading to frustration and low engagement, with a higher chance of making errors that will compromise the safety of the patient. The care delivery system must be strong enough to prevent human errors or system failures that will harm the patient. In health care, it can be challenging to be completely error-free. However, a robust system is enough to recover from human error and system failure before it harms the patient. This can be achieved by a well-designed interface, there is no value of healthcare attribute if it is not safe at the center of the system. (Battles, 2006)

Level 3: This level includes the remaining quality aims- timely, efficient, effective, and equitable. These are also equally important and are achievable with a well-designed interface, that will assist us in finishing a task promptly making it an effective and efficient system, but according to Battles (2006), they should be considered only after levels one and two are fully addressed. When we talk about patient-centered care and safety, a well-designed good interface in an EHR can assist in achieving those aims.

**Goals for gap analysis with accomplishment hopes**

Organizations need to know where it is now and point out the gaps between their present state and future state. Once the gap is identified, my goal is to first complete a SWOT analysis of the change that I had proposed, then determine the current integration needs, Confirm the current enterprise architecture strategy (reusable assets versus new technology required), and Refine the case (CGI 2014)

My workflow concern was the issue with the poor EHR Interface. According to binariks.com, a user-friendly EHR system interface must include 14 core principles to enhance EHR/EMR usability and they are Consistency, Visibility, Match, Minimalism, Memory, Feedback, flexibility, message, error, closure, reversibility, language, control, and Documentation. By examining the workflow concern I hope to accomplish the above-mentioned user-friendly EHR interface system.

EHR interface style logic should be the same across the entire system. Users should be able to visualize and comprehend information that is displayed in the EHR user interface. Related information should be made accessible on one screen. To facilitate user information processing, the EHR system interface should match the real environment. Minimalism should be followed by eliminating unwanted steps so that the users can complete the required action with only a few clicks. Alerts and reminders should be limited to life-critical notifications that will lessen the time clinicians spend on navigation and dedicate more time to patients. Memory load to be reduced by replacing data entry with checkbox, saving information from previous forms, and many more. User action is to be accompanied by real-time feedback. Breadcrumbs can be implemented for navigation. Users should be able to customize the EHR system to reduce the time needed to complete a task by letting them use shortcuts, save settings, and add voice recognition. When a user does anything wrong, they should be able to add a concise error message with a troubleshooting option. It should have the ability to prevent data entry errors by checking the input automatically. EHR interface should have a function that allows users to go back to the previous screen along with editing and undo actions. The language used should be consistent and readable with common terminology and phrases. Users should feel that they are in control of every step without any confusing messages and unexpected results. EHR interface should be able to assist users with added information when a complex action is required.

I agree with McGonigle and Mastrian that EHR might look like simple automation from the surface, but its implication remains broad ranges from care-delivering ways to the nurse interaction with their patient using technology and to the research surrounding EHRs informing tomorrow’s nursing practice.

**Data collection method**

There are many methods we can use in data collection. According to indeed.com, the various data collection methods include Observation, Survey, Focus group, Interview, Design Thinking, and User testing. The data collection method I would be using is the Survey method.

There is usually little to no interaction between surveyors and those who are doing the surveys and, In this case, based on my workflow issue, the people who are doing the surveys will be the EHR users. To develop a user-friendly EHR interface via the survey method of data collection, we will focus on gathering multiple-choice and written answers about EHR interface. Firstly, the survey is sent to all the current EHR users with a deadline of 3 weeks. Short answers and multiple-choice questions with a space for additional comments if they want to share more. Once the deadline is met, the organization will collect all the data, analyze it, and decide on how to use the findings.

The individuals we will be including are mainly EHR users. Patients can be included to get an idea of how we can design a patient centered EHR interface. Mostly open-ended and short answer questions with additional space for comments are included. For instance, we can use the following type of questions where the responders can check the options provided.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Questions | I don’t know | Strongly disagree | Disagree | Agree | Strongly agree |
| I have enough knowledge on the current EHR |  |  |  |  |  |
| I am satisfied with the current HER system |  |  |  |  |  |
| I have enough time to take care of my patient while using the EHR |  |  |  |  |  |
| The screen in my HER responds quickly to actions |  |  |  |  |  |
| Do you want additional feature on your HER that will assist you in providing high quality care with minimum effort |  |  |  |  |  |

Checklists, Questionnaires, Case Studies, Surveys, and observation are the tools that can be used to collect data. Deciding on the tools is important for data collection because research is done for different purposes in different ways.

**Minimizing disruption**.

Communication needs to be transparent which helps in setting expectations and reducing surprises. Methods that do not require interference or constant interaction to be used, The approach needs to be respectful, Briefing before the team starts observation on what you are looking for and debriefing afterward to gather feedback and assist in mitigating any disruption caused.

**Avoiding biases**

Defining clear criteria will help evaluate the present state and identify gaps as this will reduce personal biases and ensure consistency. Gathering ideas from multiple sources such as different teams, and departments, to get a comprehensive view. Rather than personal opinions and assumptions relying on factual data and evidence along with using metrics benchmarks can help avoid biases. Maintaining Independent analysis by avoiding pressure from stakeholders

**Data record/quantify and analyze**

After collecting the data from the source, I will use a robust data recording system that ensures data consistency and integrity such as manual input processes, automated scripts, and data logging tools**.**

For data quantification, I will ensure that the data points are in consistent units and will aggregate data over pertinent time intervals that will be daily or weekly. I will also aggregate data by location or product.

For data analysis, I will compare present data with the baseline metrics that are already established which will assist me in identifying the trends and deviations. Using statistical methods, I will analyze the pattern and relationships in the data, and at the end I will create a graph or chart that will help in understanding the trends and present findings. Following this I will be monitoring continuously and refining data collection, analysis, and quantification from the insight I have gained.

**Establishing baseline metrics to normalize data from different information sources.**

First, it is very important to understand the data source and the data type, formats, and any known problems in the data. The next step is identifying the common metrics across all data sources that are suitable for normalization. Dates, numerical values timestamps can be the common metrics. Following this we move towards cleaning the data and preprocessing, where we clean the data and address missing values that will make sure our data is ready for normalization and further analysis. The next step will be normalization, according to Splunk.com, normalization is organizing data entries ensuring that they look similar across all the records so that it is easier to search group and analyze the information. After this we choose a baseline Source by selecting a data source as a baseline, following this, we apply the normalization technique across all data sources, and we then evaluate normalization for effectiveness.

**Illustration of my current-state workflow**

1: Receiving input: First, we receive initial input from the user

2: Processing input: Input is processed using chat processing and knowledge Retrieval. In chat processing language model is used to understand the context and information is retrieved based on a query for the data stored.

3: Generating response: Response is generated based on processed input and is formatted appropriately for delivery.

4: Delivering output: The response that is generated is delivered via an appropriate channel (Interface) to the users.

5: Feedback: feedback is collected to improve future responses and update knowledge.

**Swimlane:**

A diagram of a medical record

Description automatically generated

**Fig: Example of a basic EHR interface related to appointments.**

**Conclusion:**

The interface complexity is usually proportional to the system complexity. The more features in the software, the more challenging it becomes to develop an intuitive interface. We must face challenges during this process, but the end product is worth it. If we design a proper EHR interface, we don’t have to worry about redesigning later which saves time, and unexpected software development expenses lowering the cost.

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