Design Principles

Histology Specimen Time Outstanding

1. **Introduction**

The Histology Laboratory faces a notable challenge with the absence of visual performance insights. To address this, the dashboard provides a comprehensive visual representation covering various specimen types for easy evaluation. It offers a quick overview for management and assists employees in identifying areas for efficiency improvements and delayed specimens. This dashboard presents a snapshot of outstanding specimen time, detailed insights into specimen types and processing times, and highlights areas needing attention. Design is critical, balancing key information with a clean, uncluttered appearance and interactive elements for deeper exploration (Malnik, 2022). For specific laboratory terms, please refer to Appendix 1.

* 1. Objectives:

The objective of this dashboard is to provide a real-time, practical snapshot of the laboratory's status. It should be understandable and valuable to personnel at all levels within the laboratory.

1. **Design principles:**
   1. User:

Identifying the intended users of this dashboard played a pivotal role in the design process, guiding choices regarding layout, structure, and the data to be visualized. The primary audience for this dashboard consists of managerial staff, but it should also be user-friendly for all laboratory employees, regardless of their positions.

* 1. Selection of Data:

Selecting the right data type and volume is critical. The chosen data was deemed significant for all dashboard users. Tracking the average time a specimen remained outstanding over a defined period was crucial for monitoring laboratory progress. Analyzing the distribution of outstanding specimen times allowed users to discern the common duration for most specimens. Additionally, comparing the time outstanding for different specimen types (urgent and routine) offered a deeper insight into varying processing times, enabling informed decisions, such as prioritizing certain specimen types.

Choosing time outstanding as a key performance indicator (KPI) was straightforward. It was essential to compare the average processing times at each stage of specimen authorization, identifying areas in need of improvement to enhance overall efficiency.

This comprehensive breakdown of outstanding time by specimen type and urgency serves as a vital tool for identifying areas requiring enhancement, like staffing levels, ultimately improving turnaround times. Furthermore, it facilitates an in-depth examination of factors contributing to time variations across different sub-specialities, such as breast or urology specimens (Calzon, 2023).

* 1. Layout/Data Hierarchy

The dashboard's layout underwent multiple revisions, with a primary focus on achieving simplicity by limiting the number and types of charts. Strategic placement of textual data at the top was driven by the need to keep key performance indicators (KPIs) visible, in line with the "Z pattern" of eye scanning (Soegaard, 2022).

Positioning the most critical charts just below was based on their significance. The top left corner displayed the timeline for the average outstanding time of specimens, while the top right corner showed a comparison of urgent and routine specimens.

Highlighting the contrast between urgent and routine specimens took priority over visualizing distinctions among various specimen types. Thus, this graph was placed at the bottom, as the last to be encountered. While somewhat less critical than other graphs, it still provides valuable insights, justifying its presence on the dashboard. The design aims to balance simplicity with essential information presentation.

The Dashboard is displayed horizontally for the purpose of desktop viewing, which can be viewed on the individual screen or presented on a larger screen.

* 1. Charts:

The timeline utilizes a trendline to efficiently track variations in specimen outstanding time over a specified period. To depict the distribution of outstanding time, a Histogram is selected, providing a clear visualization of the most common timeframes.

For contrasting urgent and routine data, a stacked bar chart is used, offering a concise, user-friendly method for assessing variations in the specimen journey through the lab based on urgency.

In comparing specimen types and their respective outstanding times, a histogram proves useful, particularly with similar quantities like "biopsies levels x3" and "biopsies with special stains." The histogram visually compares the two.

Initially, each bin's precise value on the histograms is displayed, but this cluttered the appearance. Users can obtain exact values by hovering the cursor over the bins if necessary.

* 1. Interactive Design:

The goal was a clear and user-friendly dashboard where each graph is self-explanatory. Interactive features allowed users to isolate data, with filters enhancing interactions between graphs. It was crucial to enable users to drill down into data, pinpointing individual patient cases and identifying areas for improvement. For example, in the Histogram illustrating Time Outstanding for specimen types, users could select the "Urgent" bin, accessing specific specimens and their outstanding times. This empowers users to take targeted actions based on this information, maintaining clarity and efficiency.

* 1. Colour:

The Dashboard's color scheme primarily employs various shades of blue, chosen for its neutral and informative qualities, aligning with the primary goal of providing insights to the management team. It's complemented by light grey and dark grey elements. In the Timeline chart, the average line is deliberately colored orange to create a distinct contrast, drawing users' attention to this specific chart (Priddy, 2021).

1. **Challenges and considerations:**

The most significant challenge encountered revolved around prioritizing information, although all the dashboard data held equal importance. However, it remained essential to align the dashboard's design with its core objective. While each piece of information contributed to various aspects of the same narrative, the utmost importance was attributed to the comprehensive overview of specimen time outstanding.

1. **Summary:**

The critical principle of user-centred design should be continuously revisited during dashboard development. This is particularly pertinent in the case of this dashboard, where the primary focus is on visualizing the outstanding time of specimens. Consequently, every element within the dashboard was purposefully selected to enhance comprehension and provide essential insights related to this central theme.

This deliberate selection encompassed the choice of chart types and the displayed information, all of which contribute to the same overarching narrative. Users, after interacting with this dashboard, should leave with a more profound understanding of outstanding time for various specimen types, empowering them to make well-informed decisions that, in turn, enhance laboratory efficiency—a mutually beneficial outcome for both the staff and patients.

1. **Recommendations:**

In the future, a secondary dashboard designed primarily for staff could offer a comprehensive perspective on the journey of specimens within the laboratory. Leveraging advanced digital pathology and a sophisticated specimen tracking system, this dashboard has the potential to precisely identify the whereabouts of any specimen in the laboratory. Moreover, it could provide staff members with real-time data updates as time progresses, from days to weeks and even months.

1. **References:**

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Malnik, J. (2022). *Why Are Dashboards So Important for Your Business? 8 Ways They Help Improve Business Performance | Databox Blog*. [online] Databox. Available at: <https://databox.com/why-are-dashboards-important>.

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1. **Appendix:**

**Appendix 1: Glossary**

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| **Terminology** | **Description** |
| Date of Specimen | Date the specimen was taken from the patient. |
| Date booked in | Date the specimen was booked into the lab’s LIMS system (Winpath). Note that this can be different to the day the specimen was received in the laboratory, due to a backlog in the lab and delays in transportation. |
| Today’s Date & Time | Day data was pulled from Winpath. |
| Sub-Speciality | The sub-speciality group of the specimen. This is more specific than the specimen type as it involves the anatomical location of a biopsy e.g., upper, or lower GI tract, and distinguishes biopsies from large specimens. |
| Specimen type | There are 7 types and depending on the type of stains they need and the number of levels they are required to be cut, they will fall into different specimen types. |
| Date of status | The day the specimen was sent out of the laboratory and given to the pathologist or placed in a pooled tray. |
| Lab number | The patient's unique ID number provides confidentially to the patient as their specimen travels through the laboratory. |
| Total time/Time outstanding | Total summation of time from when the specimen was taken to when the data was pulled from the Winpath before they were authorised by the pathologists. |
| Specimen-Booked | The time between when the specimen was taken to when it was booked into Winpath |
| Time in lab | The time from when the specimen is booked into the lab to when it is sent out of the laboratory. |
| Pathologist/Pooled | The time the specimen spent with the pathologist or in the pooled tray before the data was pulled from Winpath. Note that only non-authorised cases were pulled. |