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ISTITUTO ROMAGNOLO PER LO STUDIO DEI TUMORI DINO AMADORI

Optimizing Radiotherapy Utilization through Systematic and Synergistic Real-time Monitoring

HSD2

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Objective

This study examines the implementation of dashboards for **monitoring radiotherapy** services, focusing on activity **volumes**, **patient wait times**, equipment **downtime**, and **operational metrics**. The goal is to **boost efficiency**, **enhance patient care**, and **support data-driven decisions** through real-time dashboards.
The project was implemented at "IRCCS Istituto Romagnolo per lo Studio dei Tumori" (**IRST**), which operates radiotherapy services at two locations with different radiotherapy machines.

Figure 1. IRST radiotherapy locations.

Methods

A **Qlik Sense dashboard** system was developed to integrate data from EHR and radiotherapy management systems. It visualized **key performance indicators** on user-friendly dashboards, enabling real-time monitoring and analysis. These dashboards were accessible to professionals ranging from radiotherapy managers to medical directors, supported by training sessions to ensure effective utilization.

Results

The dashboards provide **real-time activity insights** that enhance the management of radiotherapy services.
Each year, about 2,100 patients undergo radiotherapy, totaling 15,000 sessions. Therapy cycles are categorized as **urgent** (35 prescriptions/year), **priority** (700 prescriptions/year), and **schedulable** (680 prescriptions/year). Some prescriptions are scheduled without priority, aligned with research protocols or concurrent chemotherapy.

The dashboards enable data analysis for differentiated responses, prioritizing curative radiotherapy over palliative treatments.

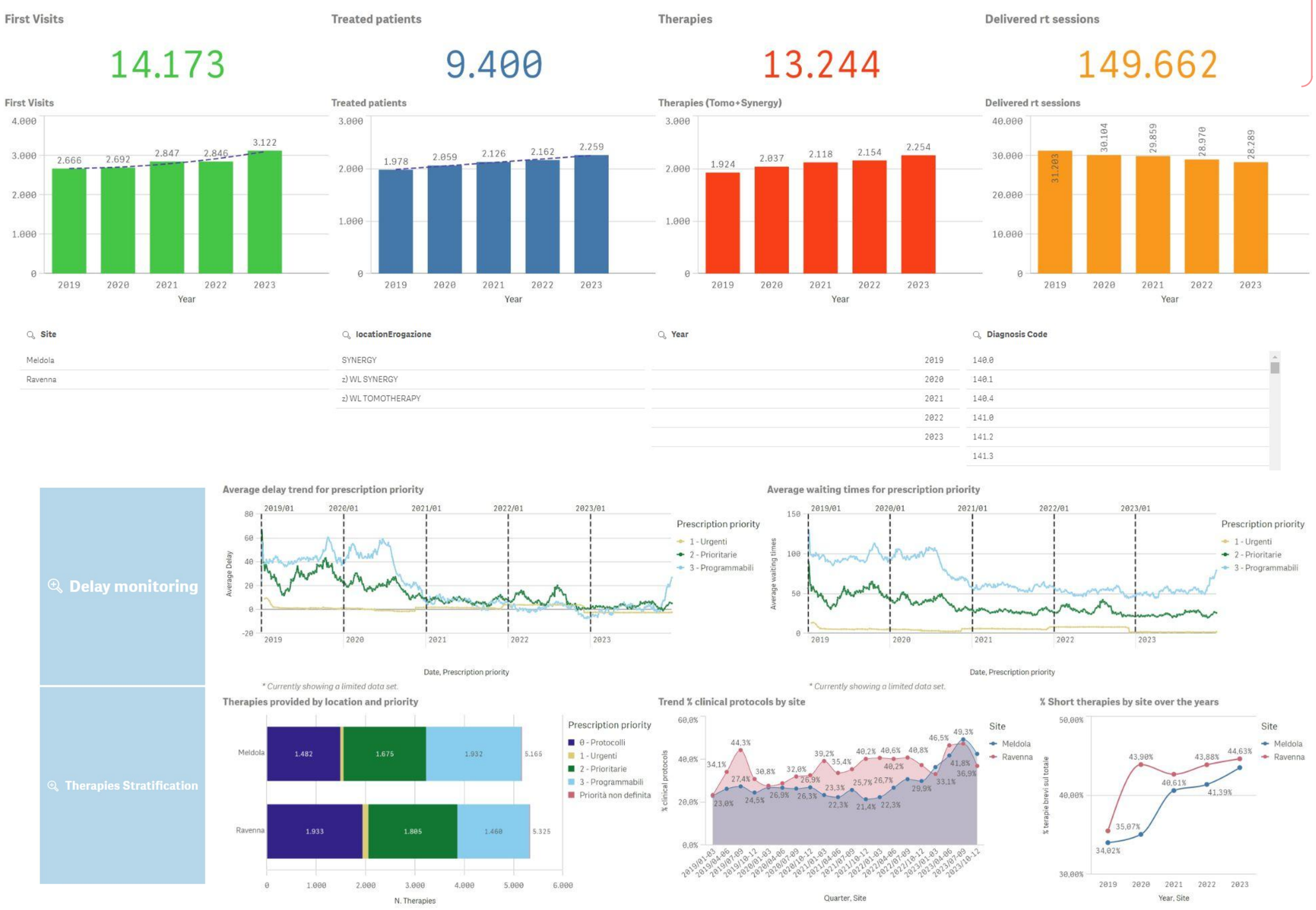

Figure 2. An overview of the dashboard created in QlikSense

The dashboards **enable** prompt **corrective actions**, ensuring service continuity during machine downtime. During a machine replacement, the median waiting time for priority activities increased from 25 to 31 days. To address this, Saturday sessions and extended daily hours were introduced, which restored optimal waiting times. Monitoring activity volumes helps **optimize scheduling** and **resource allocation**. Additionally, communication in team meetings is enhanced by providing clear performance insights and highlighting areas needing attention.

Conclusions

Radiotherapy services' **dashboard improves efficiency** and patient care **by** giving **real-time** access to **data**. This suggests other centers could also benefit from using such systems. Future research could refine dashboard features and explore integrating them with predictive modelling to improve decision-making.

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