Using data to help novice surgeons improve robotic surgery case efficiency

UW MS. HCDE Capstone Project

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Context

Each additional minute in robotic surgery increases patient risk and drives up medical expenses. The operating room (OR), accounting for 60-70% of hospital revenue and with costs of $46 per minute, necessitates a focus on optimizing surgical case efficiency.

A core driver of case efficiency is the surgeon's skill. However, novice surgeons in many hospitals often lack the infrastructure and resources to evaluate their performance and make actionable improvements.

Problem

① Unstructured

Without a self-evaluation process, surgeons lack the means to improve, while the absence of a structured tracking mechanism hinders the assessment of efficiency enhancements.
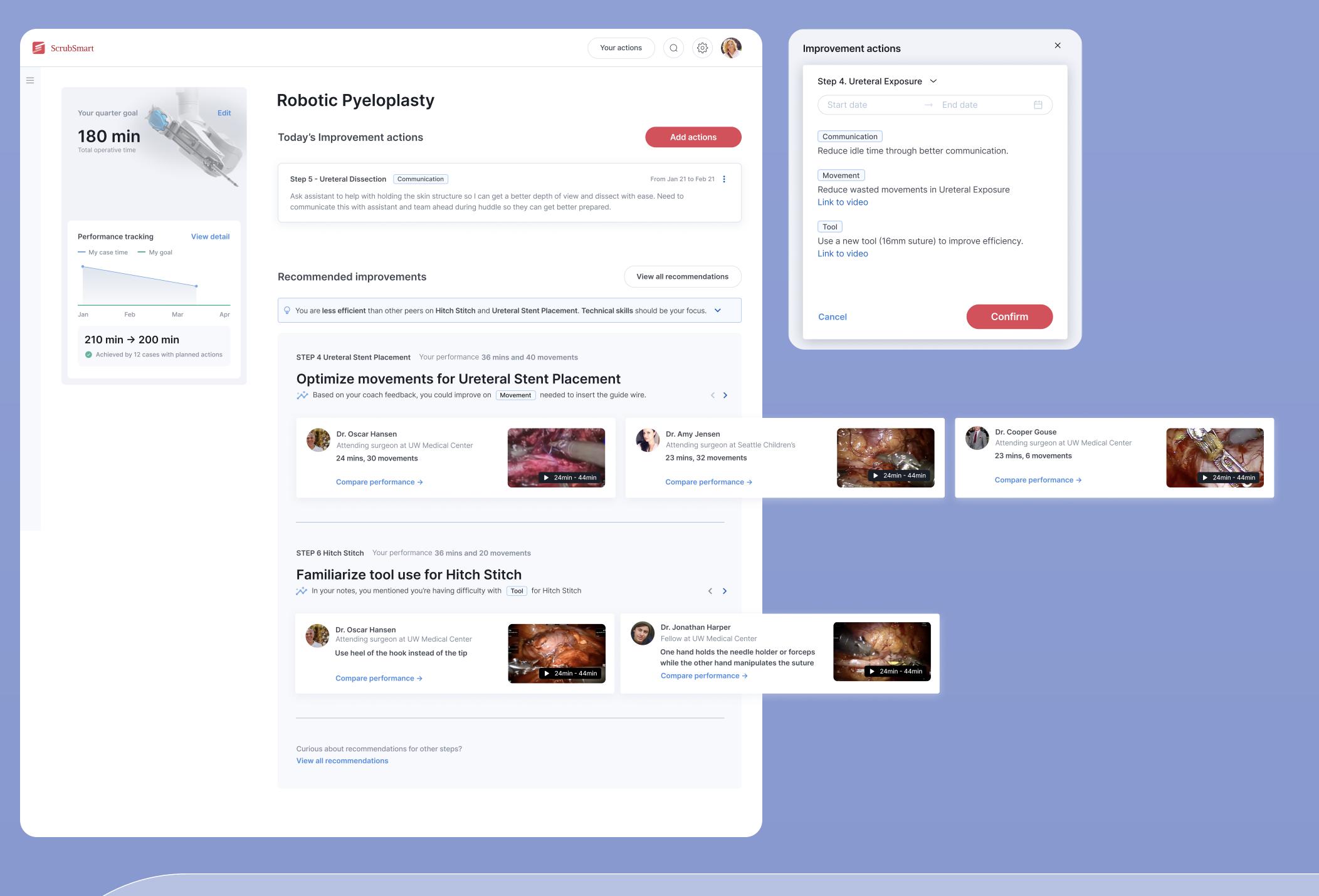
② Uninspired

One-on-one coaching to get personalized feedback is rarely available constrained by costs and hospital size. Finding the right resources for self-improvement is challenging, and time-consuming.

③ Uncontextualized

Unstructured data such as EHR, surgeon's notes, and surgery videos is abundant but siloed, hindering analysis and utilization for feedback and actionable insights.
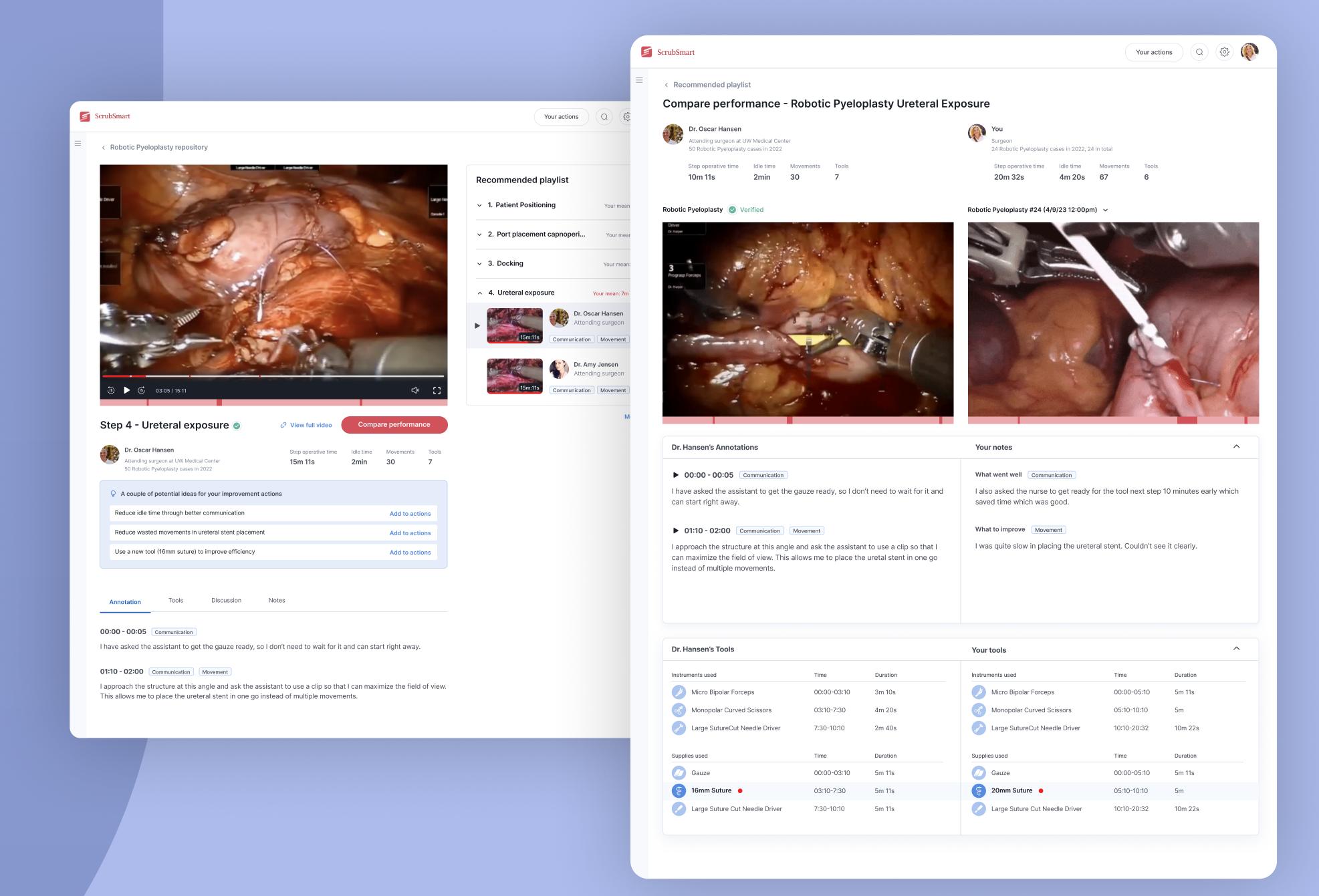
Process

Research quarter		Design quarter	
Discover opportunities	Deep dive in 1 space	Ideating solutions	Actualize designs
Method 100+ Literature reviews 6 interviews	**Method** 4 more interviews 2 hospital visits	**Method** 3 concept testing sessions	**Method** Use case prioritization Information architecture Blueprint
Outcome User journey from pre to post op 5 opportunity spaces	**Outcome** Detailed insights in 1 problem space	**Outcome** Validated concepts and corrected misconceptions	**Outcome** An aligned vision and actualization of ScrubSmart

② **Expert-inspired**
Improvement actions

Surgeons can access curated playlists of relevant resources tailored to their goals and compare their performance with expert surgeons' videos.

① **Structured**
Goal setting

Surgeons can view their performance, establish long-term goals, and access recommended learning resources for planning short-term actions.

③ **Contextualized**
Feedback based on operative time, video and notes

Surgeons can effectively track their performance, add contextualized notes post-surgery, and share surgery videos with other surgeons for feedback.