

WISEHOCKEY®

■ A game changer

Real-Time Sports Analytics Platform

Overview of the Wisehockey® system

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1. Introduction

Wisehockey® is an automatic real-time sports analytics platform that provides accurate visualized statistics for coaches, league management, players and fans as well as TV broadcasters and betting services.

Wisehockey® consists of three main elements:

- Robust Bluetooth-based tracking system
- Accurate real-time data analytics
- Digital services and APIs for sports organizations and service providers

This document describes the Wisehockey® tracking and analytics platform on a general level. It is an overview of the Wisehockey® system and installations, including the required hardware and software, and the statistics and services Wisehockey® provides.



2. Arena infrastructure and installations

This part of the document describes the hardware and installations that are required for the Wisehockey system. Please refer to the *Rink Installations Guide* for a comprehensive guide to rink installations.

2.1 Basic setup

The hardware is built around Quuppa-based position tracking. Typical setup is a one-time effort. The installations take less than one week and do not require additional electric work.

The basic setup consists of:

- Locators (20–28 units)
- Hikvision Panoramic Series Camera
- Hikvision Pro Series Recorder
- Server (e.g. DELL PowerEdge T440)
- PoE switches (1–2 pcs, e.g. Cisco C1000-16P-2G-L)
- Ethernet cabling Cat6 (1000–1500 m)
- Networking router (e.g. Ubiquiti EdgeRouter 12)

Before the installation work, it is important to make sure that the rink meets the requirement of the installation layout plan. An installation layout plan is made individually for every rink according to the needs of different rinks.

Wisehockey carries out rink measuring as a part of installing the platform.

2.2 Rink hardware

The locators are attached to locator stands that are installed to the catwalk, lighting tracks or ceiling structures of the rink. It is important to install the locators according to the installation layout plan.

The camera is attached either similarly to the locators, or a little lower to achieve the best camera angle (e.g. to a wall).

The networking switches, recorder, EdgeRouter and server are installed and connected using Ethernet cables.

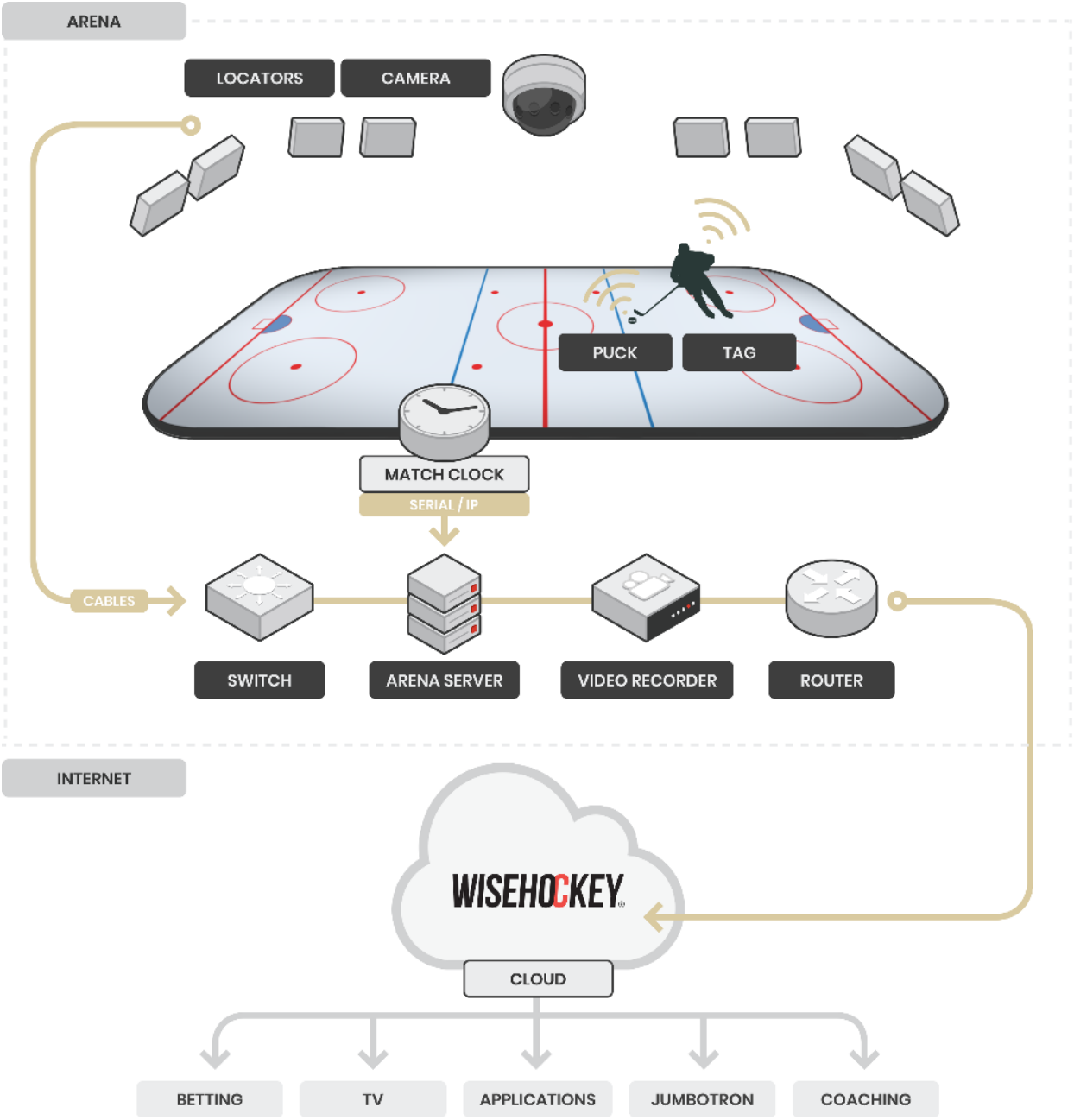


Figure 1: Hardware infrastructure



2.3 Match clock integration

Match clock integration is essential for the proper functioning of the Wisehockey system. It means routing the match clock signal to the Wisehockey platform. The Wisehockey system gains information on goals, penalties, pauses and other match events by reading the signal from the clock.

The clock integration method depends on the rink's match clock system, as clock systems may vary from rink to rink. There are two main clock integration methods: serial bus clock integration and TCP/IP clock integration.

2.4 Measuring the rink

The rink, lines and faceoff points as well as the positions of the locators need to be accurately measured. The Wisehockey system uses these measurements for match analysis.

Wisehockey takes care of rink measurement using our own staff or a subcontractor.

After all measurements have been completed, the installed locators need to be focused. The focusing allows the indoor positioning system to properly track the positions of the tags on ice.

2.5 League interface integration

Before every match, the Wisehockey system requests certain data from the league's interface for automatic data analytics. This requires integrating the Wisehockey system with the league interface.

The automatic data analytics require information on all matches and players as well as the details of some match events such as goals. The data must be presented in a certain format which is specified in a separate document.



Figure 2: Locators before installation



3. Player tags

Wisehockey player tags are Bluetooth-based positioning tag modules. Every player must wear a personal tag which allows tracking their speed and movements on the ice accurately and in real time. Match officials may also wear similar tags.

A player tag is roughly the size of a stamp and weighs only 6 grams including a battery.



Figure 3: Player tags



4. Smart puck

Wisehockey smart puck is used during ice hockey matches to produce data and statistics on the speed and movements of the puck. Automatic positioning is based on an integrated tag module that enables Bluetooth-based tracking of the puck.

The smart puck is essentially an ordinary ice hockey puck with a small positioning tag inside. The added tag does not affect the look, weight or feel of the puck but enables tracking its speed and movements. The tag is functionally similar to a player tag.

The smart puck enables tracking and analyzing shots, passes and much more. For the proper functioning of the tracking and analytics system, it is essential to have a Wisehockey smart puck on the ice and locators installed at the rink.



Figure 4: The smart puck looks and weighs the same as an ordinary puck



5. Wisehockey analytics

5.1 Overview

Wisehockey provides coaches, leagues and affiliated third parties with automatic and easy-to-use data analytics. Wisehockey analytics includes a variety of statistics that dive into

- Diverse match statistics including details on shifts, offense events, and other game aspects
- Players' shifts and different performance categories in detail
- Specific match events such as shots, passes, and face-offs
- And more...

The statistics are calculated automatically using the data from the positioning system at the rink. However, some automatic statistics also require match clock integration and league interface integration. The statistics are presented in a visual and easy-to-use way in Wisehockey webportal and APIs.

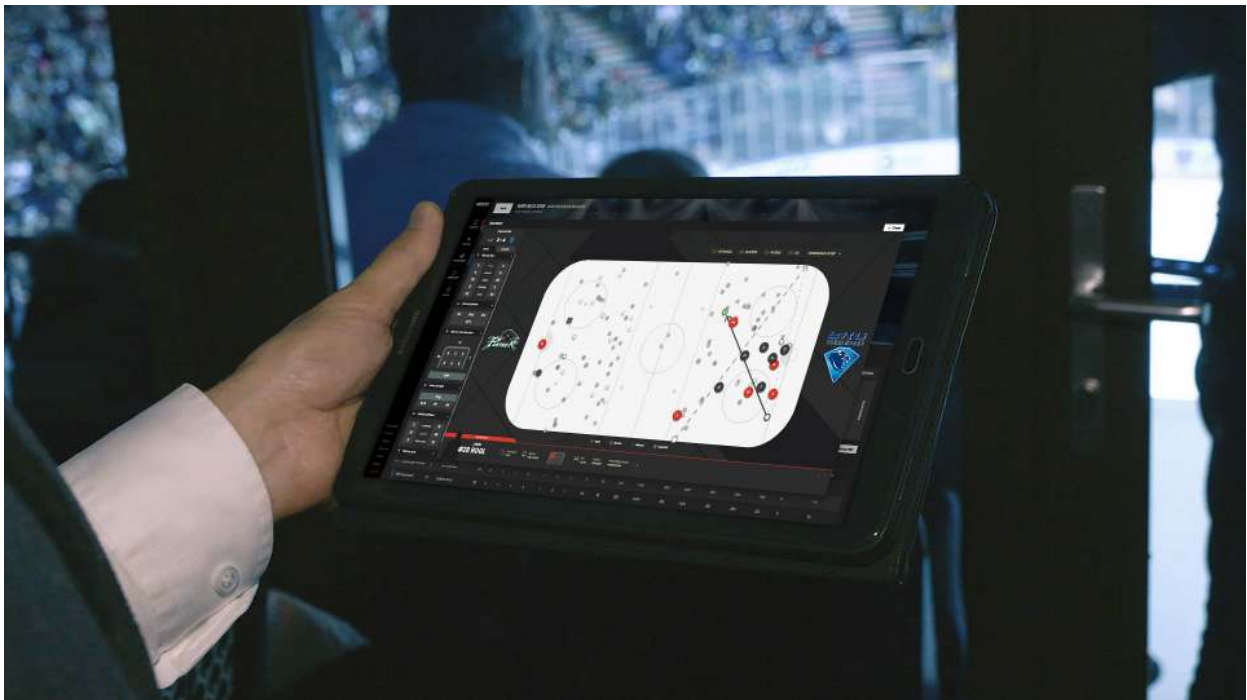
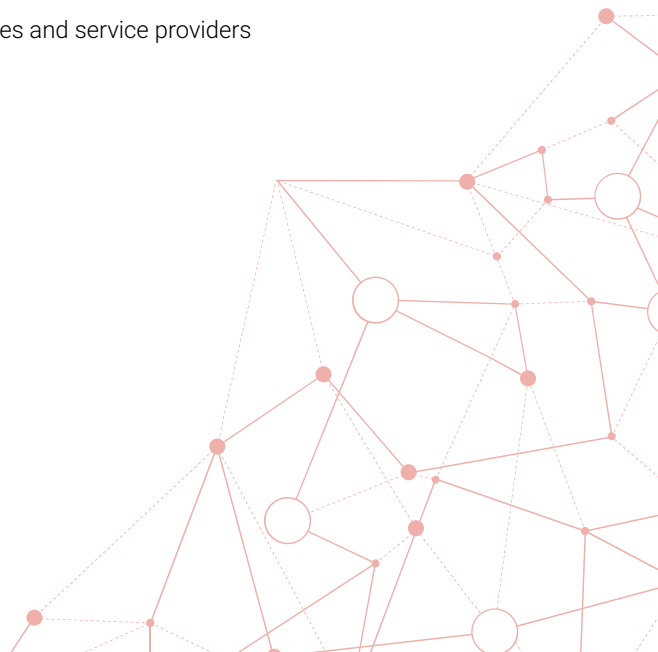


Figure 5: Wisehockey statistics are used by coaches and service providers



5.2 Webportal

Wisehockey webportal is an interface for the users of the Wisehockey real-time tracking and analytics system. Please refer to the *Webportal User Guide* for detailed instructions and information on the webportal.

The webportal provides coaches and league management with authorized access to the statistics of individual teams, players and matches. It provides a unique way to implement the most important ice hockey statistics in everyday training and management.

Wisehockey webportal optimized for both desktop and mobile provides the following **main features**:

- Match statistics (overview and detailed)
- Player statistics (overview and detailed)
- Wiseplayer (an automatic video clipping tool)

Wisehockey webportal also provides the following **optional features**:

- Manual match recordings for any games and practice sessions
- Jumbotron control panel for arena entertainment and social media content

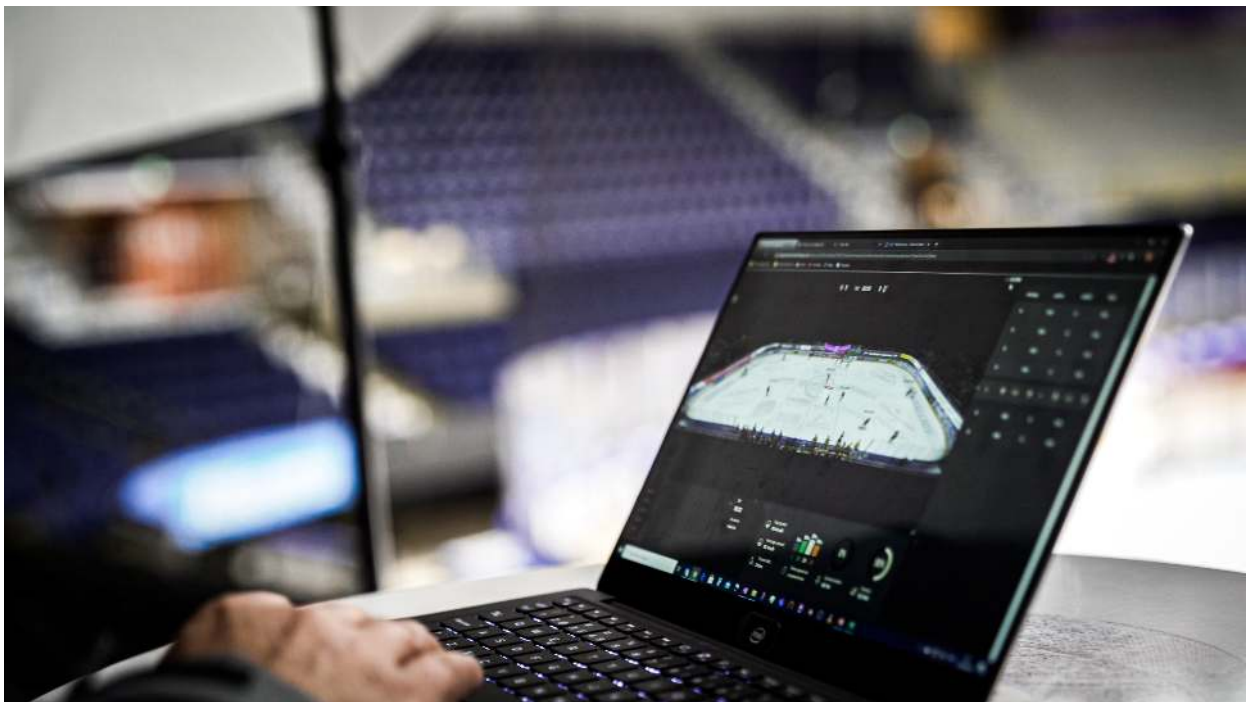


Figure 6: Webportal makes real-time statistics easily accessible



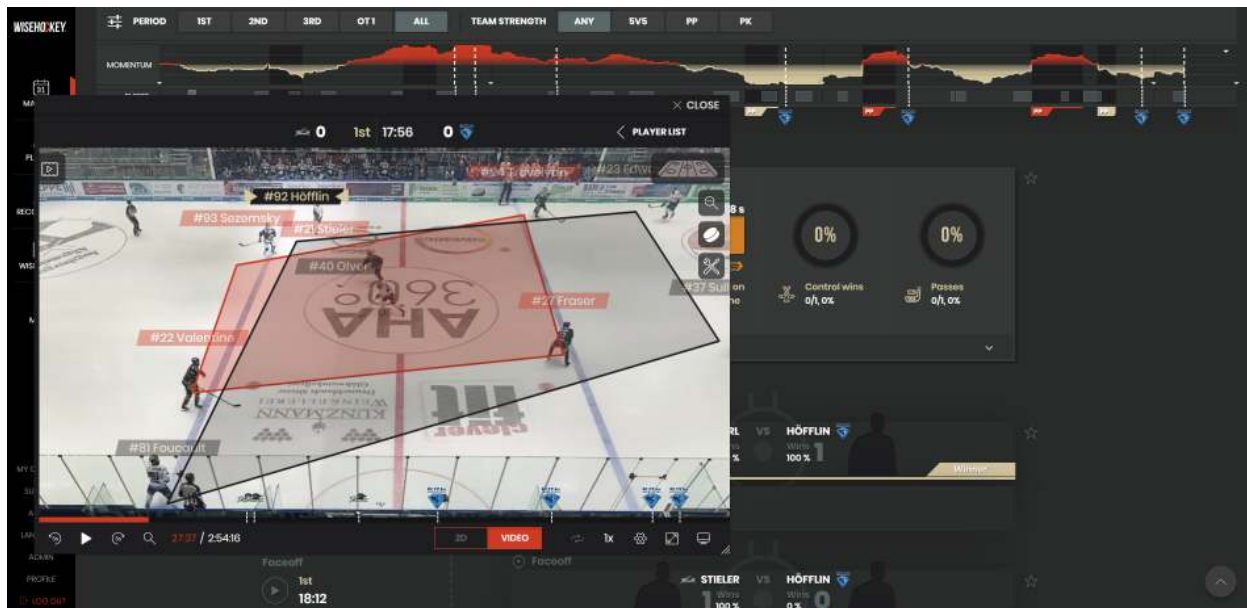


Figure 7: Floating Wiseplay video clipping tool and shift statistics

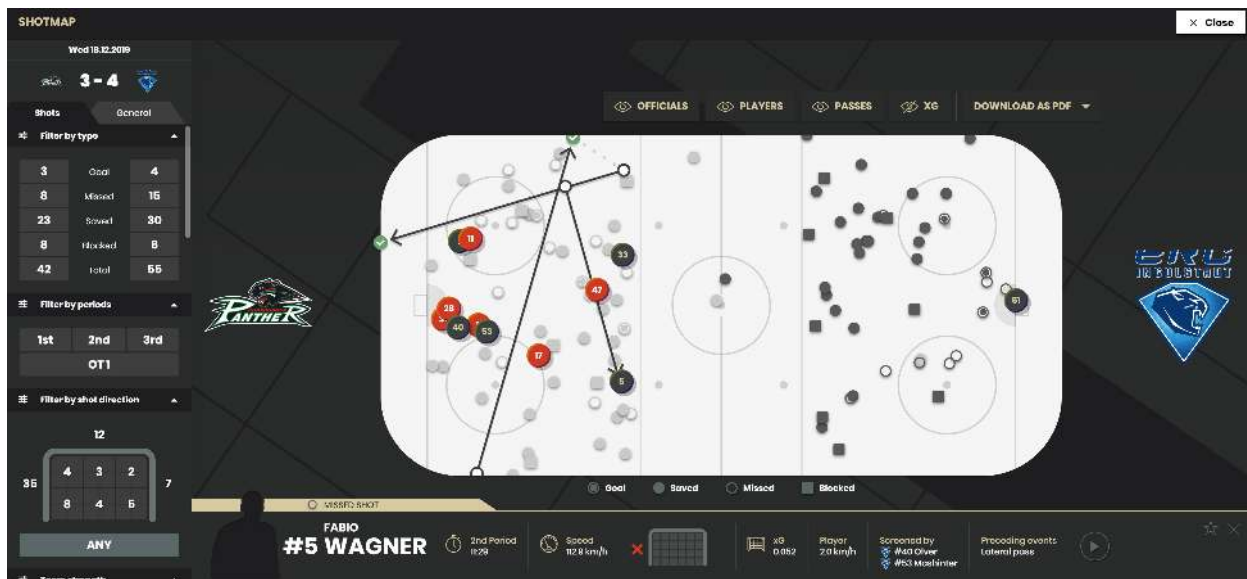


Figure 8: Shotmaps offer summaries and detailed statistics about shot events



5.3 Additional services

In addition to the webportal and basic features, additional services with affordable pricing are available to Wisehockey customers.

5.3.1 Statistics, recordings and video tools

- Wisehockey Reports – Ready-made statistics reports to your email
- Wisehockey League Portal – All teams and statistics in one place
- Wisehockey Game Recordings – Record games for automated statistics and video
- Wisehockey Practice – Record freeform play and practice sessions
- Wisehockey Quick Video – Effortless video recording without tracking tags
- Wisehockey Additional Cameras – New perspectives of on-ice events
- Wisehockey Video Tagger – Advanced video tool for clipping and note-making

5.3.2 Entertainment

- Wisehockey Jumbotron Visualizations – Automatically updating statistics displays
- Wisehockey Digitalized Memorabilia – Exclusive collectibles with verified Wisehockey data
- Wisehockey Wiseplay Experience – Automated game video features on any screen
- Wisehockey On-ice Projections – Automated live statistics and animations for ice projectors

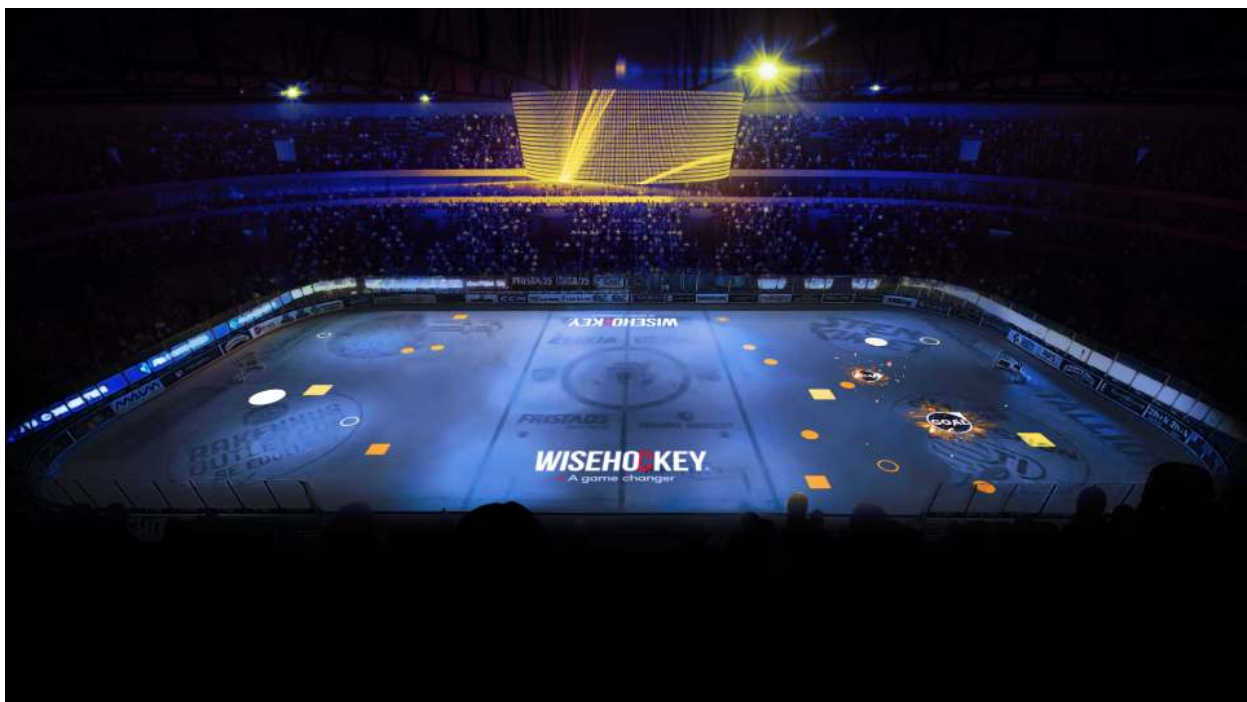


Figure 9: On-ice projections enhance the arena experience

6. Wisehockey API

Wisehockey APIs introduce a multitude of ways to utilize Wisehockey data and statistics and connect with business partners and fans.

Our public API enables reading and displaying Wisehockey data and statistics in the client's own system. Possibilities include but are not limited to broadcasting statistics in television or importing the data to a mobile app.

Wisehockey also offers an extremely low latency data streaming API built on REST that creates a true feeling of real time data.

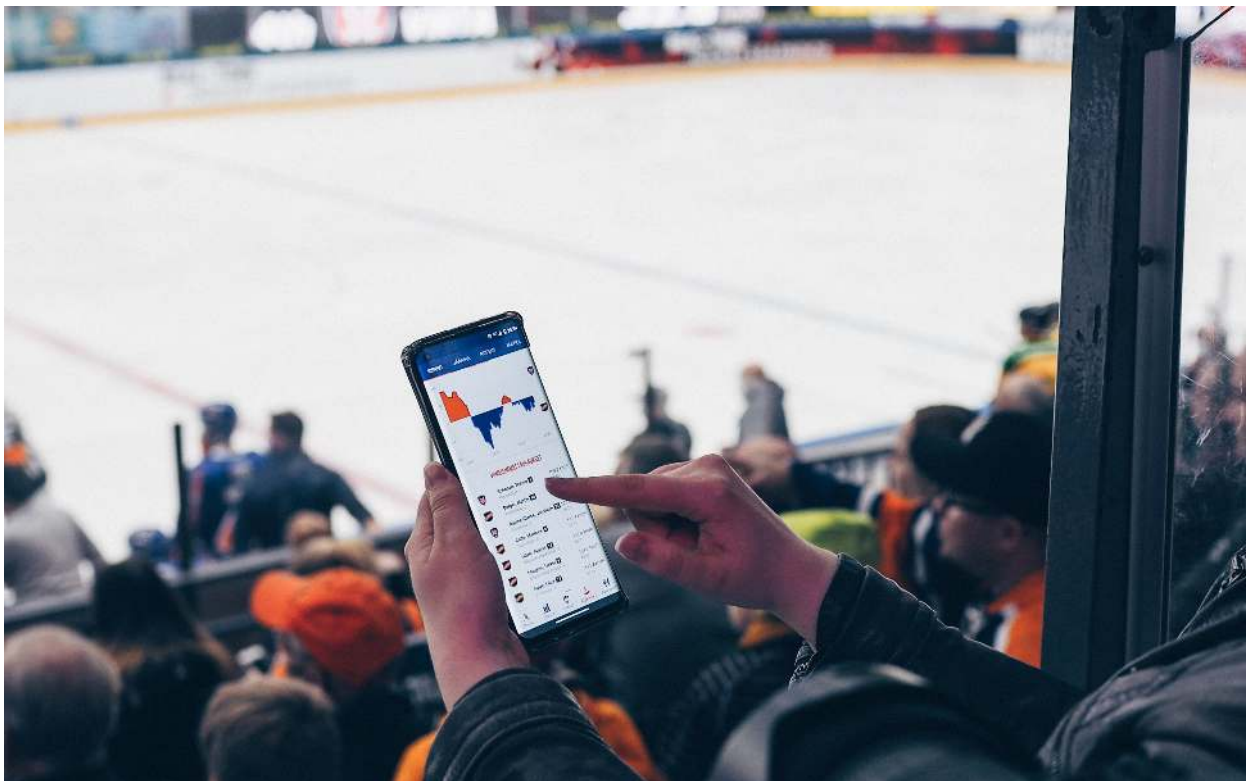


Figure 10: Wisehockey APIs provide data for third party apps and other services

