

Video Labeling Benchmark

Topics

Introduction

Take a grasp of what Video labeling is and how different it is from Image labeling.

Tooling Benchmarks

We tried most of the tools in the market to help you choose the best suited for your needs.

Technical Capabilities

Video labeling has some specific needs in term of capabilities - that's why we need a matrix for technical capabilities.

Additional resources

Picsellia has created a lot of content around video annotation, we'll give you a brief overview of all of them.

Applied AI for video analytics

As industries evolve and the demand for sophisticated AI solutions grows, the need for precise, efficient, and context-aware video labeling becomes paramount. As a reference, here are the top industries and use-cases we are seeing at Picsellia.

01

Traffic monitoring

02

Livestock analytics

03

Warehouse safety

04

Sport analytics

05

Healthcare

06

Defense

07

Retail

What is video labeling?

Computer vision models are typically trained with annotations obtained from images or video. While you can use image and video annotations to develop models for the same computer vision model task, such as object detection and object segmentation, they have distinct approaches, processes, benefits, and challenges. **Video labeling unlocks object identification and tracking.**



1. Introduction



Pierre-Nicolas Tiffreau

CTO @ Picsellia

"If I had to extract the only thing that gives video labeling sense - it would be giving IDs to objects across the video."

[Discover the full interview →](#)

Key challenges of Video Labeling



Video annotation unlocks powerful usecases for computer vision – however this tasks is challenging.

Quantity

The huge volume of **data generated by video content presents significant challenges** for storage, processing, and annotation. For businesses, this translates into **higher operational costs**.

Complexity

It requires a blend of **sophisticated software** and **skilled human annotators**. The complexity and meticulous nature of the task mean that **it can become a major cost center**, especially for projects requiring a high degree of accuracy and detail.

Heterogeneity

Efficiently organizing, storing, and retrieving annotated video data is crucial for maintaining operational efficiency and ensuring the scalability of AI projects. These issues can result in **slower time-to-market for AI-powered products** and services, increased costs for data retrieval and storage

Key capabilities

The key capabilities you should look for in a video labeling tool include **intuitive and efficient annotation** features tailored for video content, such as **frame-perfect labeling**, object tracking across frames, and the ability to annotate multiple object classes with precision.

Automation features, like **AI-assisted labeling**, to accelerate the annotation process while ensuring accuracy are crucial.

The tool must support **collaborative workflows**, allowing multiple annotators to work simultaneously with real-time updates and changes.

Robust **data management and integration capabilities** are essential for handling large datasets, including importing/exporting data in various formats and seamless **integration with existing data storage and management systems**.

Finally, the tool should offer comprehensive **quality control mechanisms** to review, correct, and validate annotations, ensuring high-quality data for model training.



MLOps Integrations

Perfect frame synchronization

AI-assisted tracking and labeling

Optimized latency to work as efficiently as possible

Built for collaboration and quality control processes

Security and Data governance features to meet compliance standards

User Experience designed for large scale Data.

Multiple Video data format support to tackle all your needs

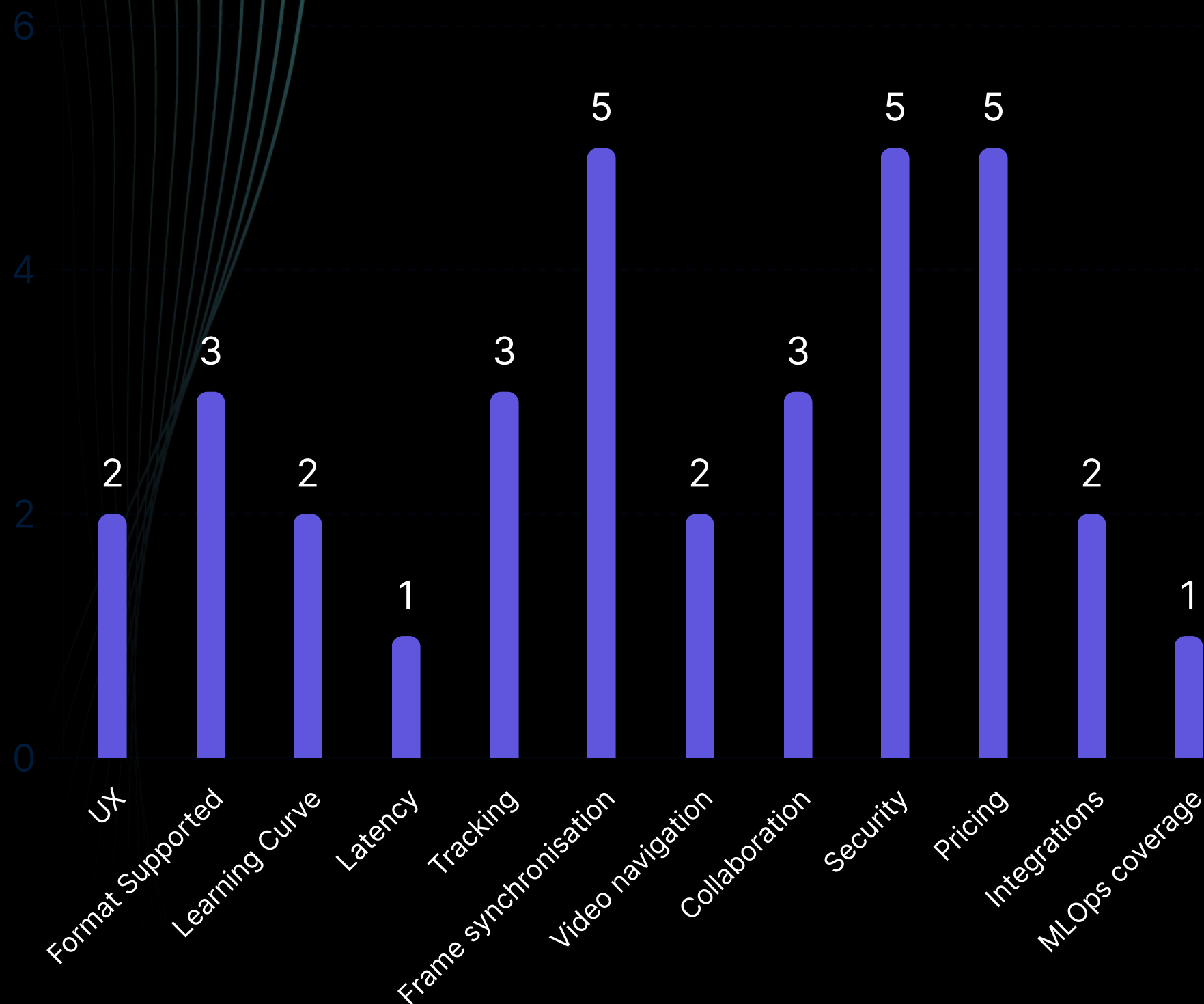
Small learning curve to onboard various people on Annotation campaigns

Benchmark Overview

	Picsellia	V7 Labs	CVAT	Kili	Scale	Labelbox
Overall UX	5	5	2	3	4	5
N° format supported	3	5	3	5	5	5
Learning Curve	4	3	2	3	2	4
Latency	5	4	1	3	3	3
Tracking & Interpolation	5	4	3	4	5	3
Frame Synchronisation	5	5	5	2	4	5
Video Player	5	5	2	4	3	4
Collaboration	5	4	3	3	4	4
Security	4	4	5	5	5	5
Pricing	3	3	5	2	1	2
Integrations w/ ecosystem	5	4	2	4	4	4
MLOps lifecycle coverage	5	3	1	2	4	3

CVAT

[Watch comparison video →](#)



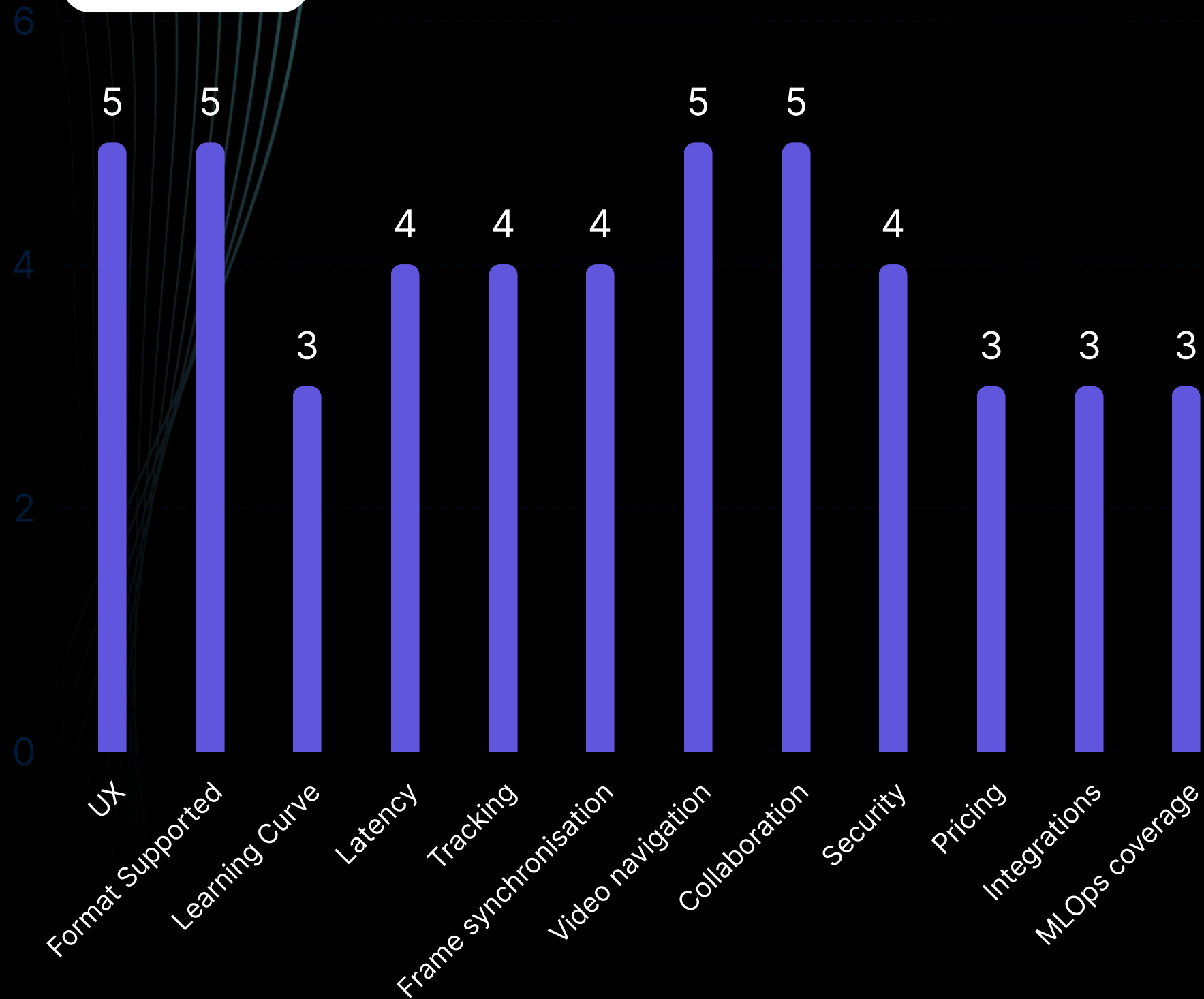
Advantages

CVAT stands out in the field of video and image annotation for its open-source and cost-free nature, offering significant cost advantages.

The platform supports various annotation types, making it suitable for various computer vision tasks. Another notable feature is its facilitation of online collaboration, ideal for team-based projects and enabling multiple annotators to work concurrently. Additionally, the integration with AI models for semi-automated annotation greatly streamlines the process. Its flexibility in customization allows for seamless integration into various project workflows, enhancing its adaptability.

Disadvantages

However, CVAT's origins as a developer-centric tool are apparent, with a noticeable lack of focus on user experience. The platform's powerful API, while a strong suit, presents a steep learning curve and demands considerable time investment for effective automation. The cost-effective nature of the tool, unfortunately, leads to high latency issues, particularly in video playback and object tracking, which can be a drawback for time-sensitive projects. The absence of a timeline feature for video editing is a significant hindrance, making the process less scalable and giving the impression of annotating each frame individually. While CVAT is competent in fulfilling its intended purpose, the user experience can often be marred by frustration due to these limitations.



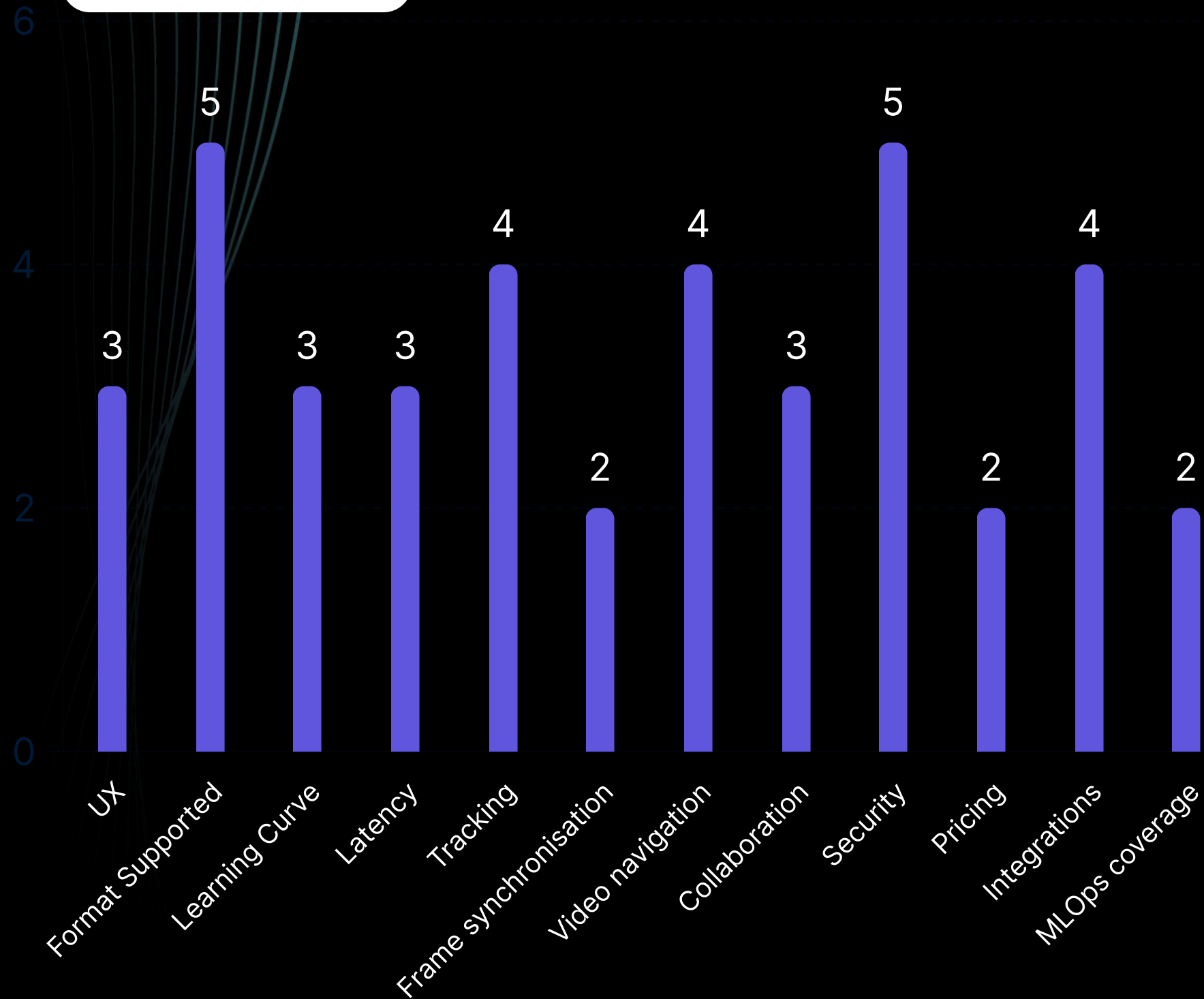
Advantages

V7labs, a pioneer in the labeling industry since 2018, stands as a bastion of reliability for a diverse array of computer vision applications. Their forte lies in handling a wide spectrum of image and video formats, with a notable proficiency in the medical sector. The tool exudes a design philosophy deeply rooted in production-grade image labeling. Its annotation workflow is not just innovative but also a powerful instrument to guarantee annotation quality. Moreover, the academic and free tiers offered by V7labs serve as a perfect gateway to acquaint oneself with the tool's capabilities before committing to a purchase.

Disadvantages

Despite its strengths, V7labs appears to be more tailored towards image annotation, accommodating a vast array of data formats. This focus, while impressive, adds layers of complexity that somewhat detract from its efficiency in video labeling. Object tracking, for instance, seems underdeveloped, offering basic prediction capabilities without a robust emphasis on prediction quality. Navigating the timeframe can be challenging, presenting a steep learning curve for new users. Additionally, there are concerns regarding time synchronization, where discrepancies between shapes and video frames could lead to potential inaccuracies.

Kili



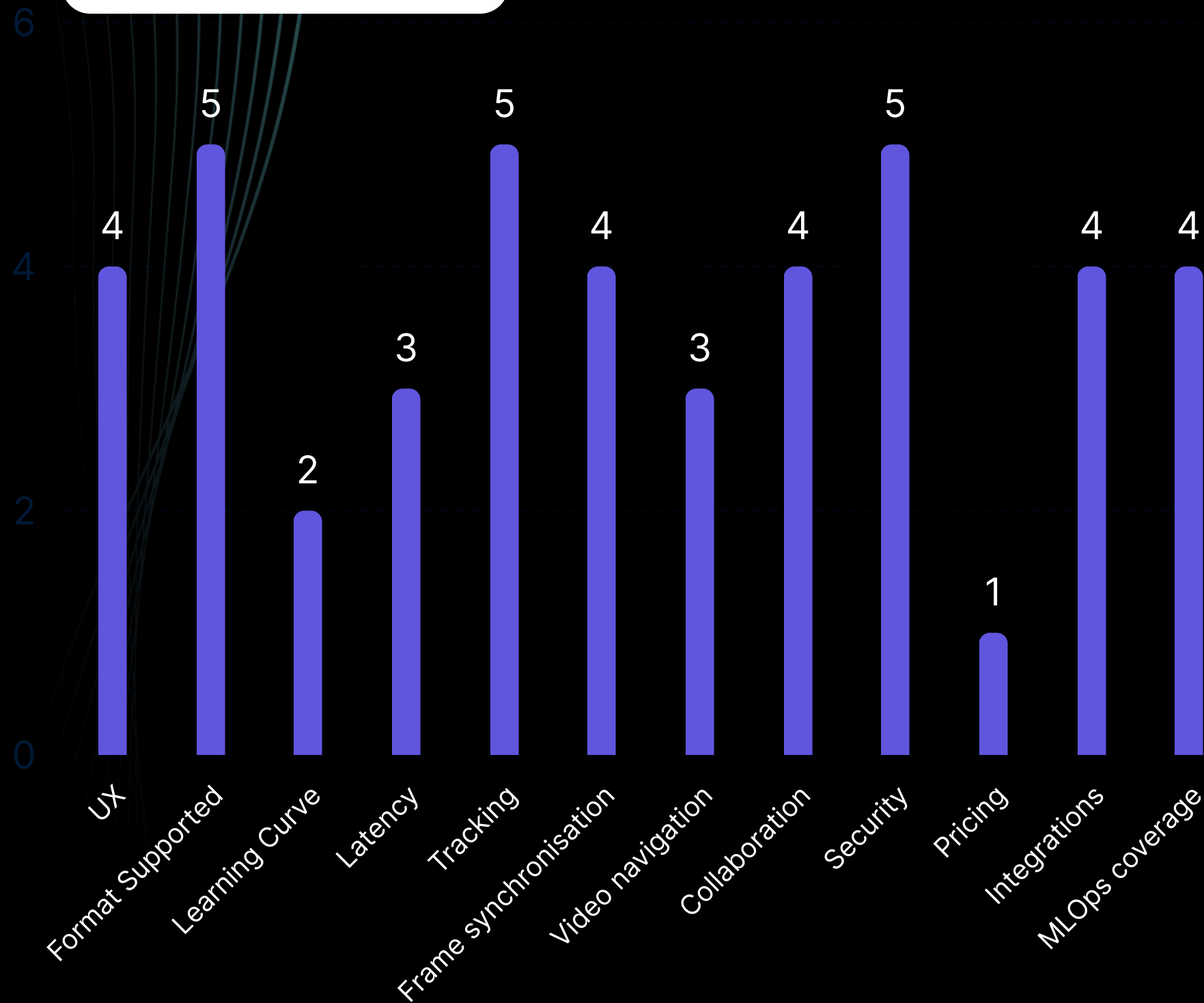
Advantages

Kili Technology's Video 2.0 offers a significantly enhanced user experience with its advanced, user-friendly interface. The platform's strength lies in its flexibility to support various video formats and codecs, allowing users to upload videos from different sources easily. It stands out with its customizable annotation tools, such as adjustable propagation settings, which empower users to tailor annotations according to the specific needs of their project. Another notable feature is the smart tracking capability, which automates the labeling of objects across multiple frames, reducing manual effort and improving efficiency, particularly in scenarios involving linear animations. Additionally, Kili enables users to build detailed project ontologies for specific use cases and offers environment customization, like adjusting the magnification factor on frames, to enhance the overall labeling experience.

Disadvantages

Despite its advancements, Kili Technology's video labeling tool has some limitations. Currently, the platform does not support videos hosted in cloud storage, which could be a significant drawback for teams that rely heavily on cloud-based workflows. The smart tracking feature, while efficient for linear animations, may encounter difficulties with erratic motions, potentially leading to inaccuracies in object tracking. New users or those unfamiliar with advanced data labeling tools might face a learning curve due to the platform's range of features and tools. **Additionally, synchronization issues between frames and shapes can arise, especially when dealing with complex video content, which could affect the accuracy and reliability of annotations**

scale

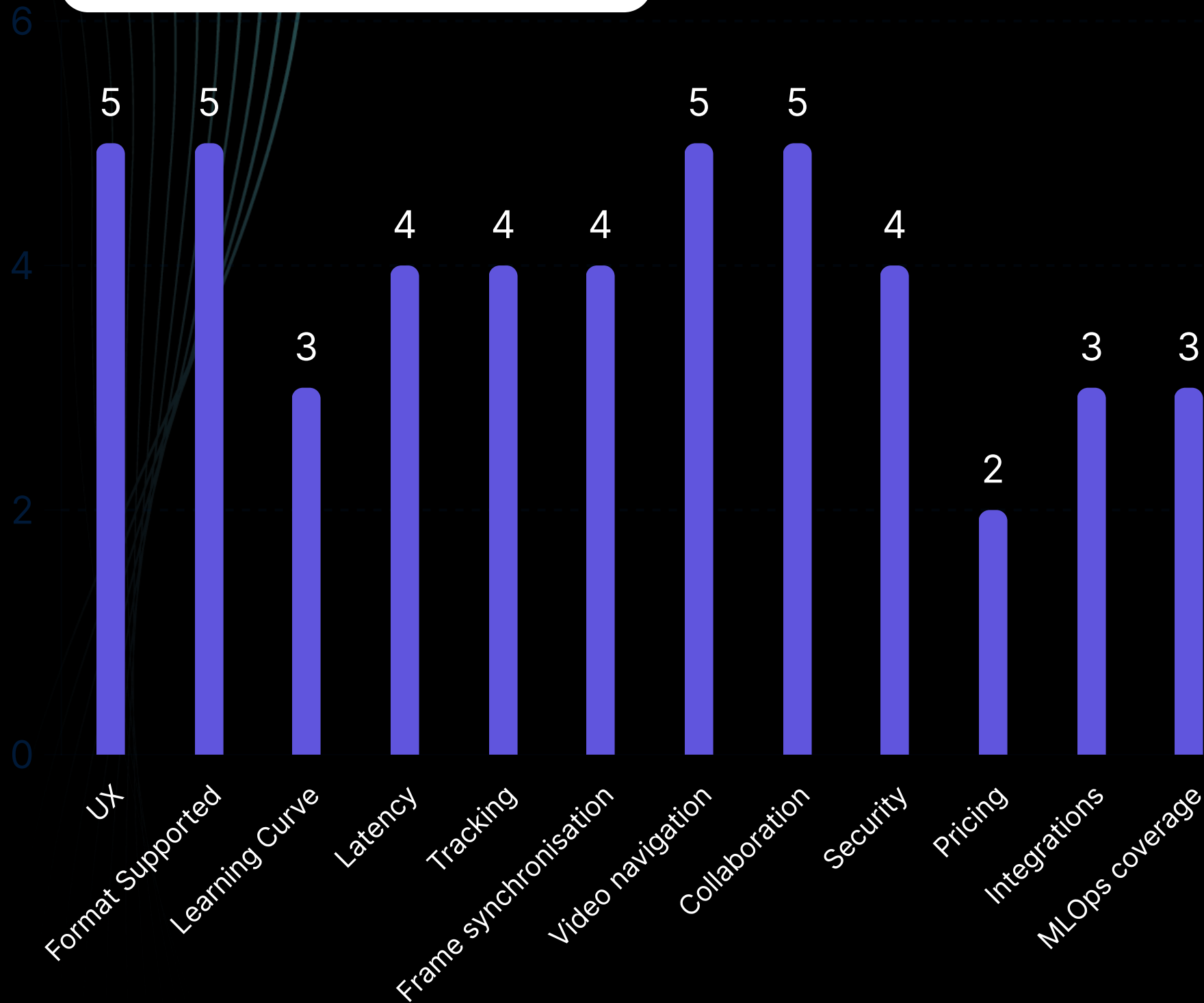


Advantages

SCALE.ai is highly regarded for its robust and scalable AI data annotation platform, especially beneficial for large-scale and complex projects. It excels in providing high-quality, accurate annotations, a crucial aspect of advanced AI and machine learning models. One of SCALE.ai's standout features is its combination of human intelligence and AI, ensuring a high level of accuracy and efficiency in annotations. This platform is known for its quick turnaround times, which is particularly advantageous for businesses with time-sensitive projects. Additionally, SCALE.ai offers a wide range of annotation services, including image, video, text, and sensor data, making it a versatile choice for various types of AI projects.

Disadvantages

However, SCALE.ai's comprehensive and high-quality services can come at a premium cost, which might be a significant consideration for budget-conscious organizations. The platform's advanced features and sophisticated AI integration might present a steep learning curve for new users or teams unfamiliar with such advanced tools. While SCALE.ai provides a high degree of accuracy, the reliance on human annotators for quality control can sometimes lead to inconsistencies, especially in large-scale projects with multiple annotators. As a comprehensive service, it may require considerable setup time and integration efforts, particularly for businesses with existing workflows and systems. Additionally, the need for consistent and reliable internet connectivity for cloud-based operations can be a limitation in environments with unstable internet access.

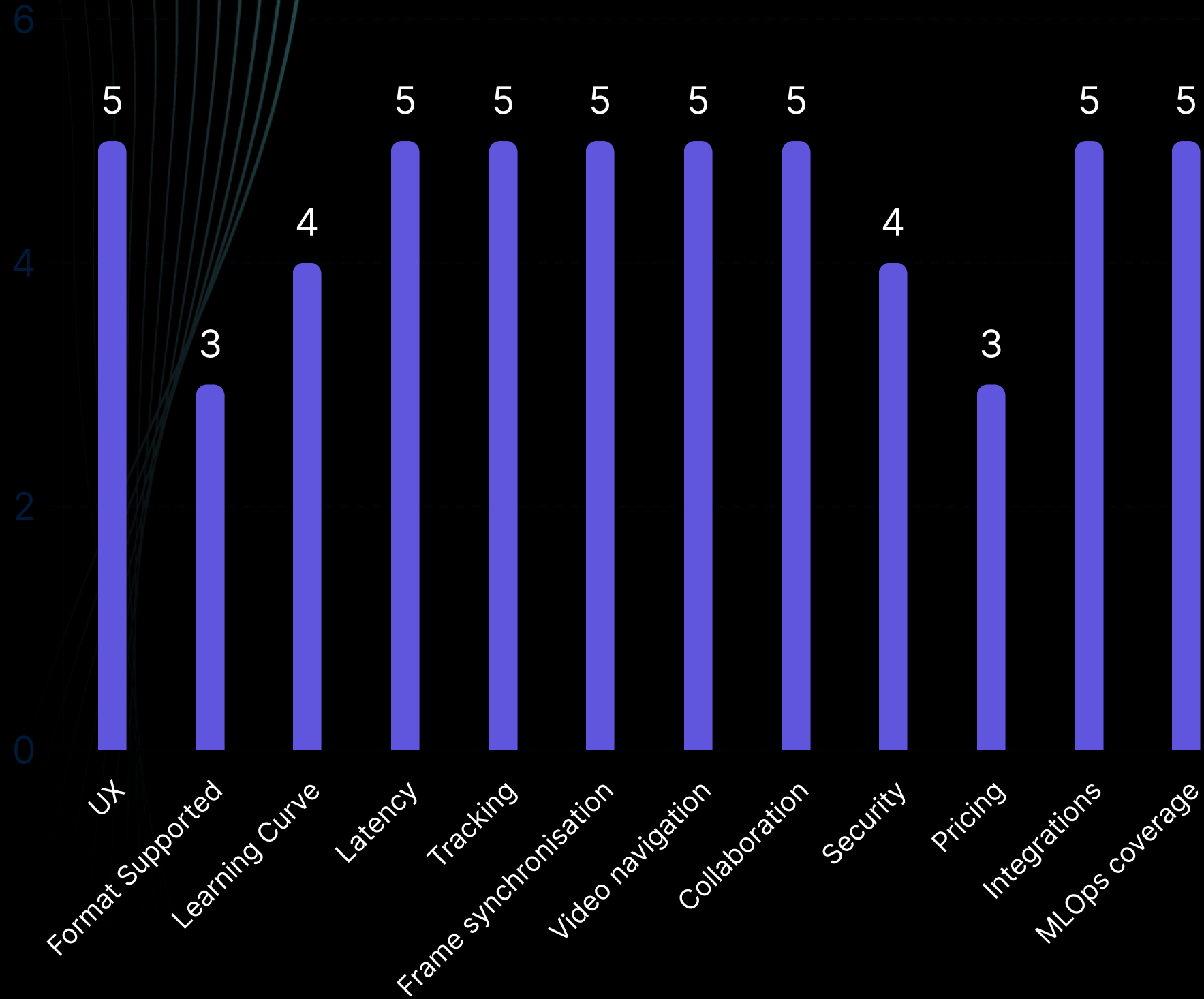


Advantages

Labelbox is recognized for its powerful and versatile annotation platform, particularly well-suited for a range of data types including video, images, and text. It offers a user-friendly interface, making it accessible and easy to navigate for users of all skill levels, which is crucial for teams with varying technical backgrounds. One of the key advantages of Labelbox is its AI-assisted annotation tools, which help automate parts of the labeling process, significantly speeding up project completion times. The platform also excels in collaboration and project management features, enabling multiple team members to work on the same project efficiently and ensuring consistency in annotations. Additionally, Labelbox provides robust integration options with various machine learning models and data storage platforms, enhancing its adaptability for different workflows and IT infrastructures.

Disadvantages

On the downside, the advanced features and capabilities of Labelbox may come with a **higher price tag**, which could be a barrier for smaller companies or those with limited budgets. Despite its user-friendly design, the platform's wide range of functionalities might result in a **slow learning curve**. Handling large datasets or intricate video annotation tasks can be resource-intensive, requiring significant computational power and potentially leading to delays or performance issues for users with limited hardware capabilities. As with many comprehensive annotation platforms, adapting Labelbox to specific project needs and existing workflows might necessitate considerable setup and customization efforts. Moreover, the performance of Labelbox, particularly for cloud-based operations, is heavily reliant on stable internet connectivity, which could pose challenges in environments with inconsistent internet access.



Advantages

Picsellia's labeling tool excels in video analytics with its user-friendly interface, **enabling efficient frame-by-frame labeling and precise object tracking**. Its standout feature, AI-assisted labeling, drastically **reduces annotation time while ensuring accuracy**. The tool fosters collaboration by allowing multiple annotators to work simultaneously on projects, enhancing productivity for large-scale tasks. With robust data management and seamless integration across various cloud platforms, **Picsellia addresses the challenges of data chaos**. Additionally, its comprehensive quality control mechanisms ensure the data's high quality, making it the ideal solution for companies looking to streamline their video labeling processes and improve their video analytics projects' outcomes.

Disadvantages

Picsellia does not support medical image formats, which could be a significant drawback for organizations or researchers in the healthcare sector requiring specialized tools for annotating medical scans or images. Additionally, Picsellia lacks functionality for handling video support directly through external cloud storage platforms. This limitation means that users cannot directly annotate or manage video data stored in external cloud services without first transferring it to Picsellia's system, potentially complicating workflows for teams that rely heavily on cloud-based data storage and management. These two constraints are critical considerations for users whose projects involve medical imaging or heavily depend on external cloud storage for video data management.

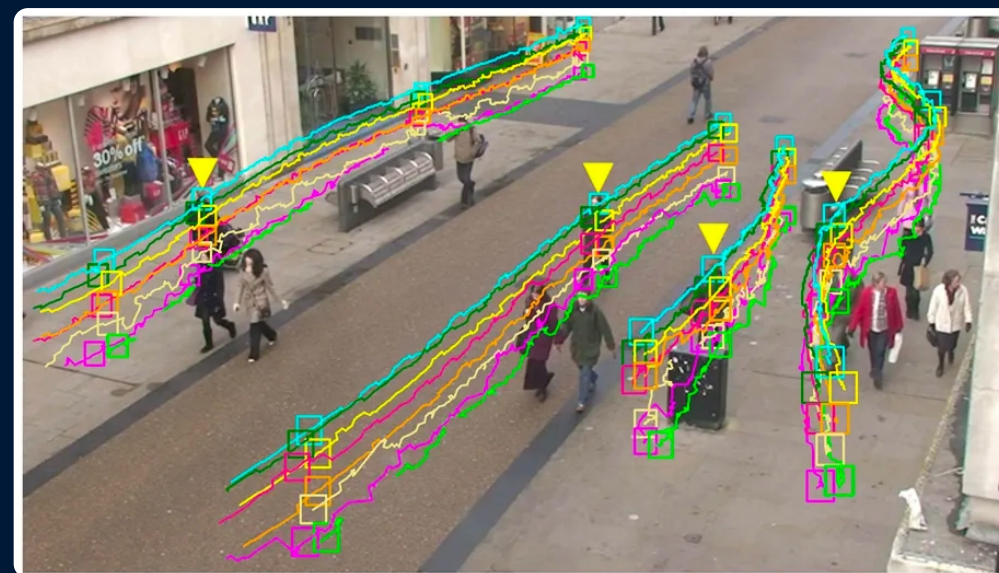
[Get a demo →](#)

Additional resources



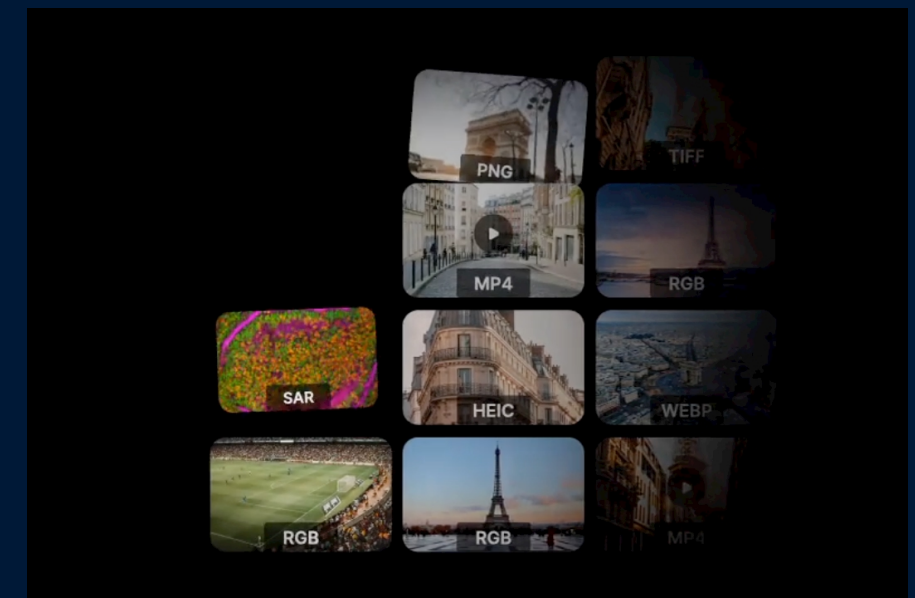
Live Interview

Dive into a 20-minutes interview of Picsellia CTO talking about video labeling.



Video annotation 101

An extensive blog post around Video labeling, the main challenges and expectations of an annotation tool.



Dive deeper into Picsellia

Picsellia is way more than a labeling tool, dive into or **Datalake** capabilities or **model monitoring** ones.