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# IMS Caliper Analyticsの最新動向

株式会社ネットラーニング 吉田 俊明  
株式会社ネットラーニングホールディングス 佐々木 公博

# ネットラーニングの紹介

株式会社ネットラーニング 吉田 俊明

# ネットラーニング グループ

ネットラーニンググループでは、インターネットを活用した教育・研修ソリューションを通じて、企業・自治体・教育機関をはじめとする各種団体が、今かかえる人材育成上の課題解決をご支援いたします。



株式会社ネットラーニング

環境変化に対応する組織変革スピードアップ



株式会社フェニックス・コンサルティング

ネットを活用したグローバル人材育成



株式会社wiwiw (ういうい)






女性活躍による経営パフォーマンスアップ

明香企業情報諮詢  
(上海)有限公司

ミンシャン企業通信コンサルティング

海外での人材育成をサポート

## グローバル市場におけるeラーニング提供会社

本拠地 (HQ)	会社名	顧客数	学習者数	提供国数
Japan 	ネットラーニング	4,386	28,064,407	94
USA 	SABA	2,200	31,000,000	195
Ireland 	Skillsoft	6,000	19,000,000	?
Italy 	docebo	28,000	?	70
India 	NIIT	?	?	40
UK 	Pearson	?	?	?

# ネットラーニング・コース 平均修了率

(2014年度)

93.9%

# IMS Caliper Analytics の最新動向

株式会社ネットラーニングホールディングス 佐々木 公博

# Caliper Analytics とは？

IMS GLOBALが策定を進める

“オンライン学習測定フレームワーク”

# Caliper

## 【キャリパー】

ノギス、測径両脚器、カリパス

## 【Caliper】

A caliper is a device used to measure the distance between two opposing sides of an object.



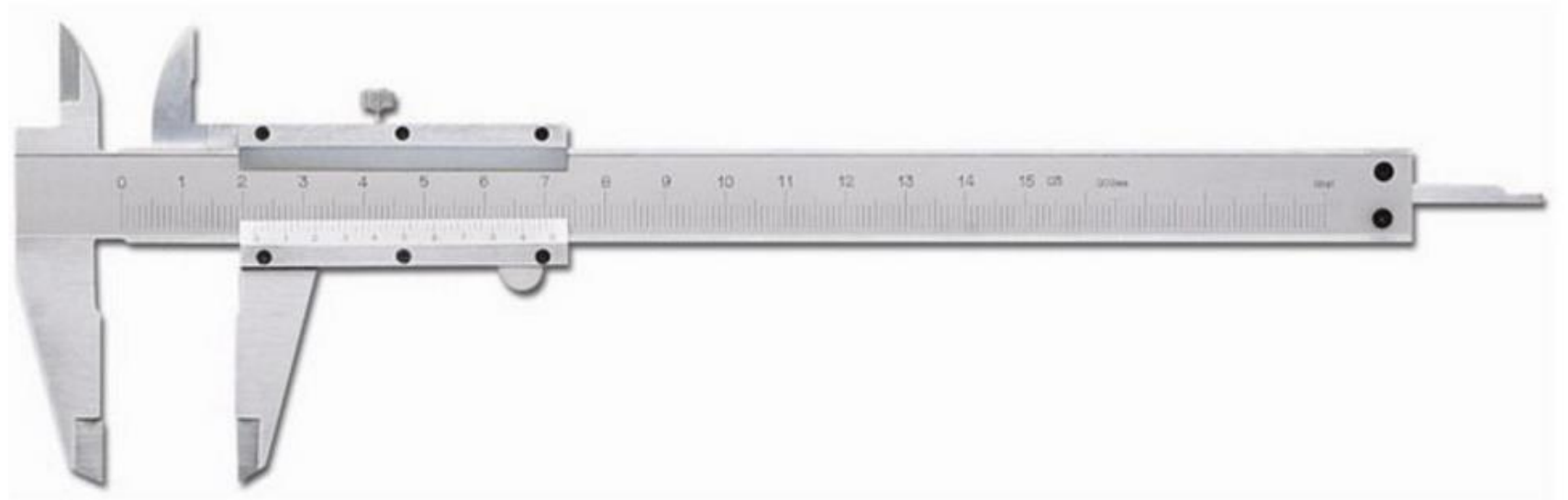
# Caliper

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# 2013/9/13 Caliper Analytics Whitepaper



## Learning Measurement for Analytics Whitepaper

### Opportunity

The online educational landscape continues to yield significant growth in online digital curriculum development, delivery and enrollment. There is also a continued heightened interest in, and now demand for, accountability regarding the ability to measure and analyze this enriched online learning activity. This interest, coupled with the more recent surge of the MOOCs and other online-only program offerings driving highly scaled online curriculum delivery, has caused the edtech ecosystem to explore and motivate a call to action to apply "Big Data" Analytics to education to drive a more efficient and informed online learning environment. All of this attention on, and demand for, accountability backed by measurability, presents a very timely opportunity for IMS and standards to take a leadership position in defining a common foundation to enable the measurement of learning activity and its performance at a very granular level.

Equipped with a standards based common foundation for learning measurement, the quality, efficacy and performance derived analytics for the online curriculum across the ecosystem can be achieved more effectively. Both the producers (i.e. institutions, instructors, curriculum developers, learning designers, etc.) and consumers (i.e. learners/students) of this online curriculum can better engage, measure, revise, and iterate to foster a much more informed continuous improvement of the curriculum and the learning experience outcomes. In addition, institutions as well as, edtech solution providers can deliver the high-demand/high-value, new and enhanced data driven extensions to the online learning delivery platform such as learning analytics, predictive analytics/pathing, adaptive learning, personalization, early warning alerts, badging/certification, etc.

Given this timely and high value opportunity scenario, some of the key challenges identified that need to be prioritized and factored into a strategy and direction to realize a learning measurement standards-based framework are:

- In the current state of online curriculum delivery, there are a non-standard and/or completely non-existent set of metrics for measuring curriculum learning activity content and feature-function edu-apps, sourced from an increasingly wider spectrum of solutions and providers. This diverse solution set is highly federated, fragmented and 'siloed' within the provider's respective delivery platform/app. These collections of solutions frequently co-exist in any given online lesson or curriculum. Some progress is being made in establishing some learning design/objective performance oriented standardized metrics (i.e. [Bloom's Taxonomy](#), [Common Core](#), [Predictive Analytics Reporting \(PAR\) framework](#), [Council for the Advancement of Standards in Higher Education - Learning and Developmental Outcomes](#)) but have yet to be more universally applied and/or leveraged within a broader context of measurements;

## 学習測定フレームワークとして、 Caliperの概要、戦略が発表された

# 2015/10/20 Caliper Analytics V1.0リリース



INITIATIVES ▾ DEVELOPERS ▾ PRODUCT DIRECTORY ▾ LEARNING IMPACT ▾ LEADERSHIP ▾

## IMS Global Learning Consortium Announces Products Certified to the Newly Released Caliper Educational Analytics Standard

*Caliper Removes Significant Barriers to Collecting and Analyzing Data to Support Student Success.*

**Lake Mary, Florida, USA – October 20, 2015** - IMS Global Learning Consortium (IMS Global), the world leader in EdTech interoperability and impact, has announced that nine leading EdTech products have achieved conformance certification to the newly released Caliper Analytics™ standard, the world's first interoperability standard for educational click stream data.

Caliper Analytics enables the collection of high rate real-time event data, via software sensors (or the Sensor API™) and information models (known as metric profiles). By establishing a set of common labels for learning activity data, the metric profiles enable the exchange of the data across multiple platforms, which will allow institutions to derive better insights from interaction with digital content, learning tools and platforms. In addition to defined metric profiles, Caliper also supports versatile "freemove payloads" in order to support existing products, information model innovation and the diverse needs of analytics researchers. Caliper is a significant milestone as the first analytics data standard created by the education community for the education community.

Several IMS Global **Contributing Member** organizations have demonstrated leadership and support for Caliper by being among the first to implement Caliper into their products and complete conformance certification. Those organizations include Blackboard, D2L, Elsevier, Intellify Learning, Kaltura, Learning Objects, McGraw-Hill Education, University of Michigan and VitalSource Technologies.

"The goal of Caliper Analytics is to reduce the cost of obtaining quality analytics data from digital educational products by orders of magnitude," said Rob Abel, CEO of IMS Global. "Just as the adoption of Learning Tools Interoperability® (LTI®) made it radically easier for institutions and faculty to innovate with learning tools and apps, Caliper will revolutionize how institutions holistically assess what is working to move the needle on improving outcomes. We applaud the leadership of the organizations that are the first to adopt and complete conformance certification for Caliper v1.0. We anticipate that many more organizations will soon follow suit as more and more institutions ask for Caliper conformance to enable consistent access to learner data."

Caliper Analytics provides more than a specification. Caliper also provides open source code and APIs (the Sensor API™) to enable rapid implementation of the standard. The Caliper v1.0 specification can be downloaded from the IMS Global public website at [www.imsglobal.org/specifications.html](http://www.imsglobal.org/specifications.html). Developer resources, including a Getting Started Guide, Implementation Guide with code, and Sensor API code in six programming languages can be found on the IMS Global website at [www.imsglobal.org/activity/caliperam](http://www.imsglobal.org/activity/caliperam). Caliper Conformance Certification is available to IMS Global **members**. A directory of IMS Certified solutions is maintained at [www.imscert.org](http://www.imscert.org).

"The University of Michigan is proud to have played a leading role in the development of Caliper 1.0, and to be the first institution of higher education to have a service certified as compliant with the specification," said Laura Patterson, Associate Vice President and Chief Information Officer at the University of Michigan. "Open standards are critical to our vision of an interoperable and loosely coupled digital learning ecosystem."

Chris Vento, CEO of Intellify Learning, added, "Given that our core business and solution enables learning data management and analytics capabilities across a wide spectrum of learning platforms and apps in HED and K12, we see first-hand in all of our implementations the benefits of Caliper to expedite and enhance data-driven services and integrations. Our and other's continued adoption and real-world implementations of Caliper will result in optimal continuous improvement and advances in Caliper's capabilities over time."

"Caliper provides a critical foundation to advance learning analytics; by creating common naming conventions and transport protocols educational institutions and technology providers can provide deeper insights only possible through combining data from multiple platforms," said Dr. John Whitmer, Platform Analytics and Educational Research Director, Blackboard, Inc.

According to Jon Mott, Chief Learning Officer for Learning Objects, "Consistent access to student learning data across multiple learning tools and environments is critical to personalized, adaptive, and competency-based learning. That is why Learning Objects, Inc. is so committed to Caliper Analytics. We are honored to be among the first vendors to certify under the new specification."

"VitalSource has been at the vanguard of support for IMS and the Caliper standard, and we share a common goal of moving the industry forward with innovative educational analytics," said Rick Johnson, Vice President of Product and Sales Engineering, VitalSource Technologies Inc. "We are pleased to announce our Caliper certification and we will continue our collaboration with IMS to accelerate the industry's efforts to measure the efficacy and improve the design of instructional materials."

"The Caliper Analytics specification is foundational to learning analytics and the mission to improve outcomes for students and educators. Elsevier is excited to be a member of the open data standards community," said Aaron Zeckoski, Vice President Software Engineering, Elsevier Health Solutions.

## 【仕様公開】 “Metric Profiles” “Sensor API”

⇒ どのようにデータを収集するかにフォーカス

## 【公式ドキュメント】

### • Implementation Guide

⇒ Metric Profilesの定義、Sensorの紹介

### • Conformance and Certification Guide

⇒ テストフレームワークの利用方法

### • Best Practice Guide

⇒ クイックスタートガイド、サンプルアプリ

“<https://www.imsglobal.org/article/ims-global-learning-consortium-announces-products-certified-newly-released-caliper>”

# なぜ、Caliperが必要？ 背景①

- ・オンライン教育の発展
  - ・MOOCの登場
  - ・学習環境(プラットフォーム,学習アプリ)の多様性
    - ⇒ 多種多様で膨大な学習データが生成されている
  
- ・テクノロジーの進化
  - ・動画コンテンツの配信
  - ・ビッグデータ
    - ⇒ 大量データを収集、蓄積、分析することが可能になってきた

## なぜ、Caliperが必要？ 背景②

- ・オンライン教育の課題
  - ・多種多様なアプリ、プラットフォームが高度に進化
  - ・学習活動の内容を評価する共通のメトリックスが存在しない



## なぜ、Caliperが必要？ 背景②

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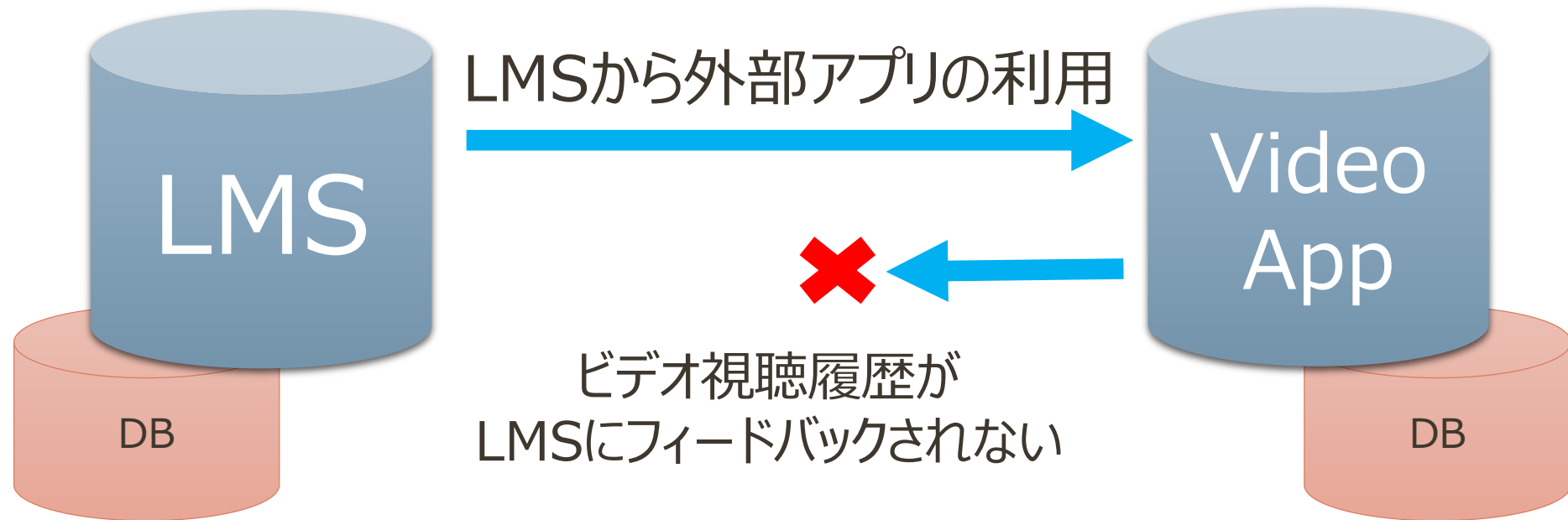


“サイロ化”

“学習履歴の断片化”

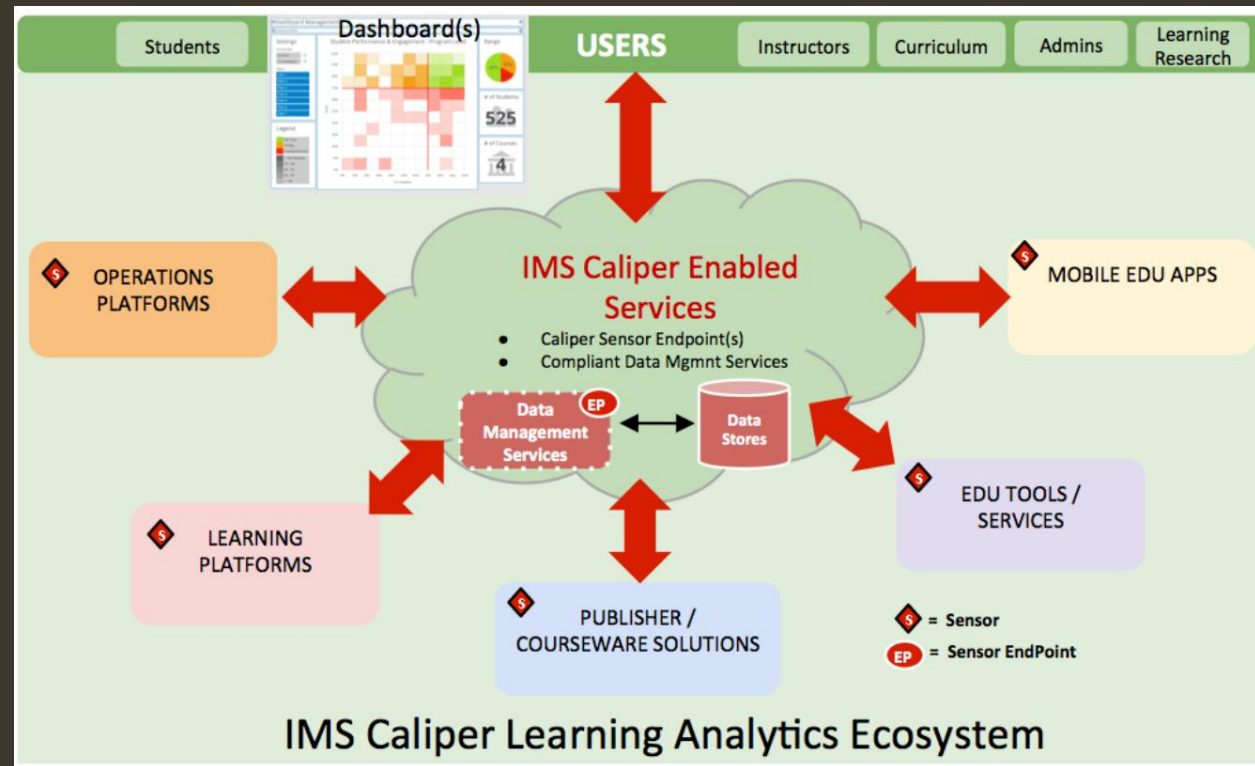
# なぜ、Caliperが必要？ 背景③

## ・オンライン教育の課題



# Caliper Analytics

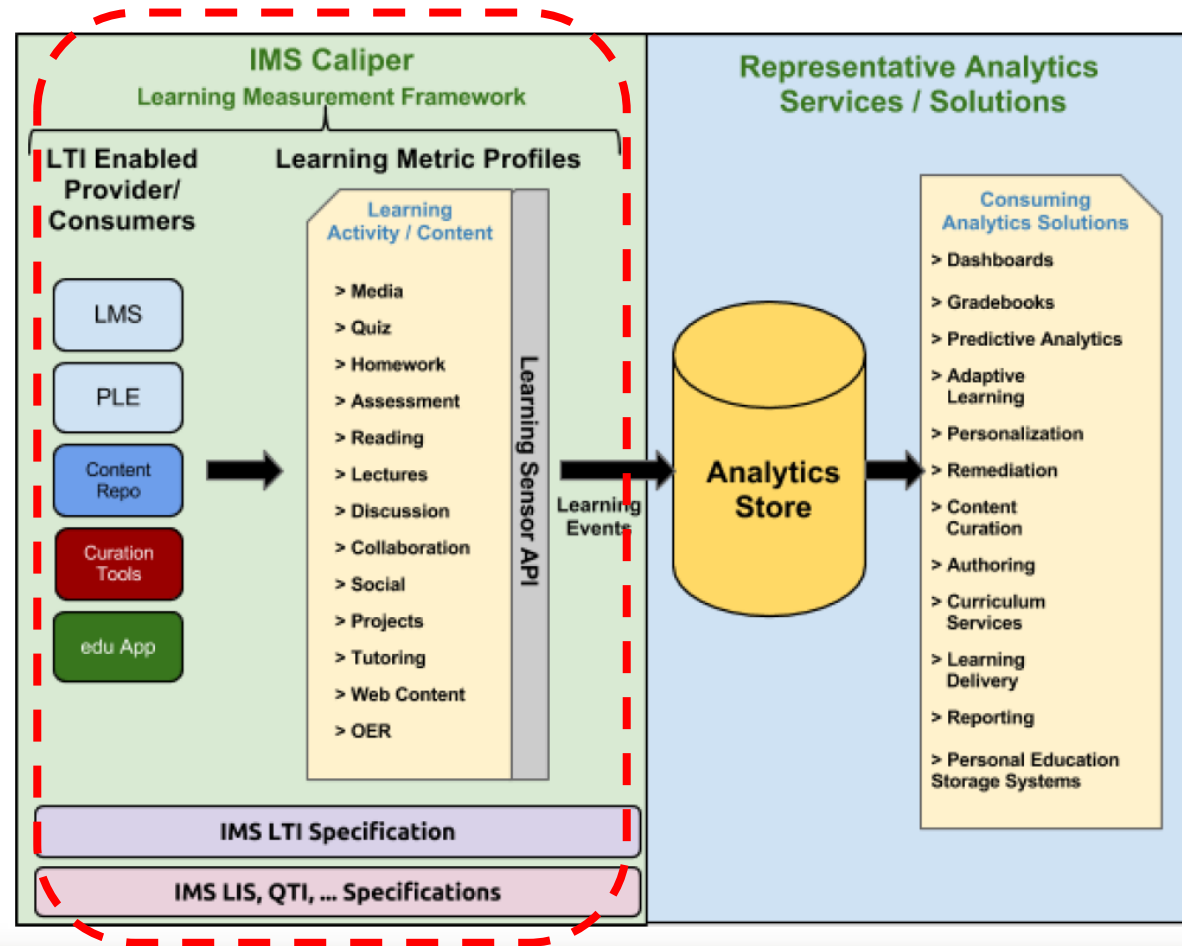
データを標準化することによって、  
様々な学習環境からデータを収集することを可能とする仕組み。  
各プラットフォームや学習アプリの相互運用性を高める。





# フレームワーク

Caliper 1.0では学習履歴の収集にフォーカス



# Metric Profiles(1)

どのような学習履歴を取得するのか？

Reading

テキストコンテンツ(EPUB3)

Annotation  
(アノテーション/注釈)

ブックマーク、ハイライト、リンク...

Assessment

クイズ、ホームワーク、テスト

Media

音声、動画コンテンツ

Base

共通となるエンティティ群

Assignable  
(割り当て)

アサイン、アクティベート...

Session

ログイン、ログアウト...

Outcome

学習結果、成績

## Metric Profiles(2)

プロフィールごとにアクションが定義されている。

たとえば、学習者が講義動画にて、

- ▶ **Media Player**で講義動画を開始した
- ▶ 動画を一時停止した
- ▶ 全画面表示した
- ▶ 巻き戻しした
- ▶ 再生スピードを変更した
- ▶ 音をミュートした



学習イベントが  
生成される

# Sensor API

APIによって、様々な学習環境から学習データを回収する

- 6種類のプログラミング言語に対応
- GitHubでライブラリが公開されている

Java

Javascript

PHP

Phthon

.NET

Ruby

```
using ImsGlobal.Caliper.Entities.Agent;
using ImsGlobal.Caliper.Entities.Media;
using ImsGlobal.Caliper.Events;
using ImsGlobal.Caliper.Events.Media;
using NodaTime;

...
var mediaEvent = new MediaEvent( Action.Paused ) {
    Actor = new Person( "https://example.edu/user/554433" ),
    Object = new VideoObject( "https://example.com/super-media-tool/video/1225" ),
    Target = new MediaLocation( "https://example.com/super-media-tool/video/1225" ) {
        CurrentTime = 710
    },
    EventTime = Instant.FromUtc( 2015, 9, 15, 10, 15, 0 ),
    EdApp = new SoftwareApplication( "https://example.com/super-media-tool" ) {
        Name = "Super Media Tool"
    }
};
```

# サンプルアプリ(Plunker)

caliper sensorを実装する練習ができる

The image shows a Plunker application interface. On the left, there is a sidebar with a file explorer showing files like 'app.js', 'index.html', 'README.md', 'sampleAppContextService.js', 'sampleAppSensorService.js', and 'style.css'. Below the file explorer, there are sections for 'VERSIONS' and 'PLUNK' with a description: 'IMS Caliper Analytics Verion 1.0 Sample App using caliper-js'. There are also 'Tags' for 'angularjs', 'caliper', 'imglobal', 'ims', 'bootstrap', and 'analytics'. The main area is a code editor showing HTML and JavaScript code for an application named 'sampleCaliperApp'. The code includes a head section with meta tags, a title 'IMS Caliper Analytics &trade; Sample Application', and links to various libraries like jQuery, Angular, Bootstrap, and Lodash. It also includes a script for the 'caliper-sensor' library. The body contains a controller 'sampleAppCtrl' and a view with a navigation menu and a content area. The content area has two sections: 'Course Syllabus' and 'Reading'. The 'Course Syllabus' section has a 'Complete Reading' button and a 'Take a Quiz' button. The 'Reading' section has a title 'States of Matter' and a paragraph of text. Below the text, there is a 'Enter Tag' input field with 'CAT' entered and an 'Add' button. There is also a 'My Tags' section showing 'My Tags = {{readingTags}}'. The 'Quiz' section has a title 'States of Matter' and a question 'Which one of these is not a valid state of matter?'. There are three radio buttons: 'Liquid' (checked), 'Solid', and 'Plasmod'. There is also a 'Gas' radio button. Below the radio buttons, there are 'Submit' and 'Reset' buttons. At the bottom, there is a message: 'Message = You answered correctly {{correctAnswer}}'.

## まとめ

- IMS GLOBALが策定を進める“オンライン学習測定フレームワーク”
- オンライン教育の現状として、各プラットフォームや学習アプリ間における相互運用性が低く、学習履歴の断片化が発生している
- Caliper Analytics V1.0では、様々な学習活動を収集することにフォーカスしている(まずはデータの蓄積から)

# Caliper研究会グループの発足

日時：2016年1月28日(木) 16:30 – 18:00

場所：新宿（株式会社ネットラーニング）

内容：Caliper研究会キックオフ

- ・研究会発足の挨拶（株式会社ネットラーニング 社長 吉田 俊明）
- ・Caliper概説（講師 イースト株式会社 高瀬 拓史 様）
- ・グループディスカッション
- ・質疑応答

詳細は資料にてお渡しします。

ご静聴ありがとうございました。

[toshiaki.yoshida@nl-hd.com](mailto:toshiaki.yoshida@nl-hd.com)

[kimihiro.sasaki@nl-hd.com](mailto:kimihiro.sasaki@nl-hd.com)