



Apereo Foundation | Learning Analytics

Ian Dolphin, Apereo Foundation | Ja-Sakai Conference | March 2015 | Tokyo

Serving the Academic Mission

Laura McCord
WhiteWhale Web Serv

Agenda

Why open source for higher education?

What is Apereo?

Apereo Learning Analytics Initiative



Why open source software for higher education?



Utility: Software that meets a need



Utility: Software that meets a need

Innovation



85%

Utility Innovation

15%



Utility Customization Innovation



Contribution

Utility Customization Innovation



Contribution

**Utility
Customization
Innovation**

Sustainability



Contribution is critical

... and not just code ...



What is the Aperreo Foundation?



Apereio is ...

- **A not-for-profit registered in New Jersey**
- **A membership organisation**
- **A network of communities**



Mission

The core mission of the Apereo Foundation is to assist and facilitate educational organizations which **“collaborate to foster, develop, and sustain open technologies and innovation to support learning, teaching, and research.”**



Foundation Provides ...

- A **deliberately minimal** set of services
 - Manage licensing and intellectual property
 - Accounting
 - Events
 - Programmes;
 - Fellows, Teaching with Sakai Innovation Award
 - Infrastructure (technical + community)
 - Access to pooled expertise and guidance

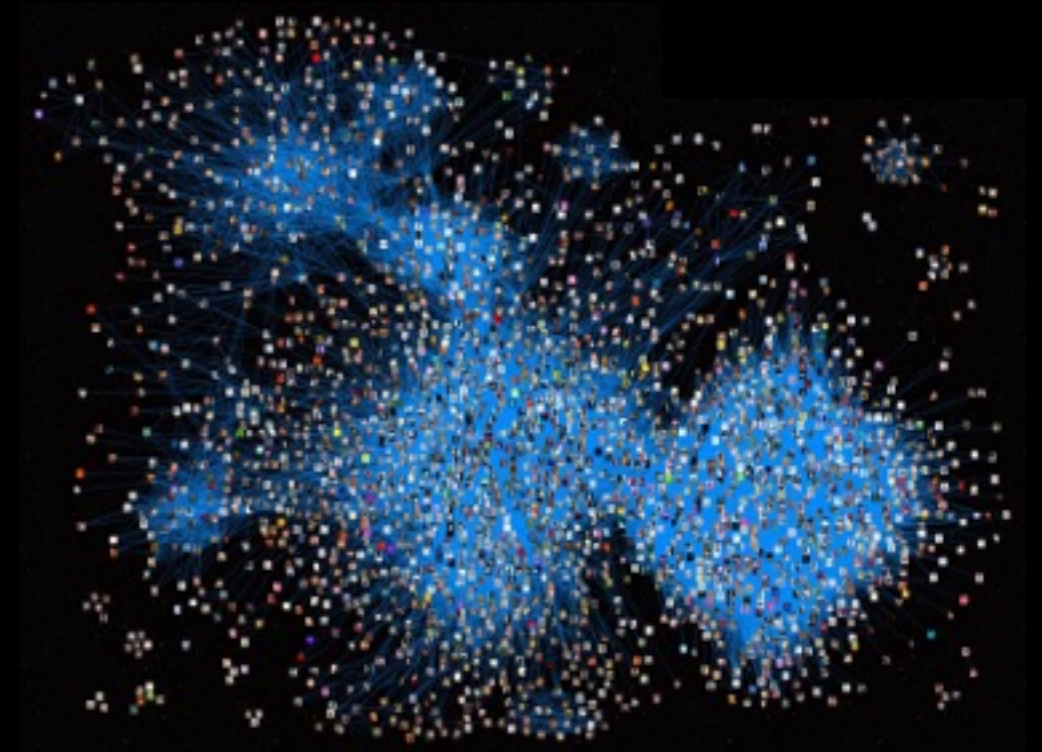


“Aperreo does not attempt to provide what projects or institutions can better provide themselves”

Subsidiarity Principle



Communities ...



- **Software Communities**
- **Communities of Interest**



Software Communities ...

Incubating...

- Karuta
- EDExchange
- Opencast
- UniTime
- Xerte

Sponsored ...

- CAS
- Bedework
- Open Academic Environment
- Sakai
- Student Success Plan
- uPortal
- uMobile



Communities of Interest



- ***Thematic*** -
 - “Teaching and Learning”
 - “ePortfolio”
 - “Learning Analytics Initiative”
- Explore work/ideas around common theme
- One of the nurseries for our *incubation process*





Duck Incubation by Sunshine. Chung King. China



Incubation



- **Software: from innovation to sustainability**
- **Structured process**
- **Guided by community mentors**
- **Results in exit by graduation ... or not**
- **Not proceeding is *not* a failure**



Networks & Partnerships

Thematic partnerships: InCommon, SoLAR

Regional partnerships: ESUP-Portail (Fr)

**Apereo will not realise its mission *alone* ...
... *or* by simple linear growth**



Aperreo Foundation

Learning Analytics Initiative





ANALYZE DATA IS INFORMING DECISIONS THIS DATA NEEDS TO BE **OPEN** AND AVAILABLE

LEARNERS SHOULD OWN + CONTROL THEIR OWN LEARNER ANALYTIC PROFILES

INTERVENTIONS

REPOSITORY OF ALGORITHMS

OPEN PLATFORM

CONG ENGINE (LMS) (PLUG-IN) ALGORITHM

@gsiemens

SENSEMAKING



LEARNING ANALYTICS*



TREND ANALYSIS

NEED

WHAT DO I KNOW?

RELATIONSHIP

WHEN THE DATA EXCEEDS COGNITIVE ABILITY TO UNDERSTAND



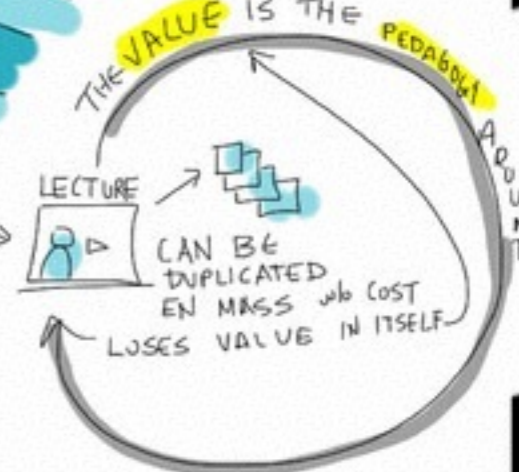
PERSONALIZATION

ADAPTIVE LEARNING



SHIFT

LEARNER CENTRED



*NOT TALKING ABOUT ACADEMIC ANALYTICS i.e. ENERGY CONSUMPTION etc

@giuliaforsythe



Context & Landscape

- Higher education: post war transformation
- Did practice keep pace with change?
- Increased student numbers + diversity
 - = impact on retention?
- Technology-driven “answers”
 - CBT, Courseware, eLearning, LMS/VLE, MOOCs ...



Business Analytics

Business analytics (BA) refers to the **skills, technologies, practices** for continuous iterative exploration and investigation of **past business performance** to **gain insight** and **drive business planning**.^[1] Business analytics focuses on developing new insights and understanding of business performance based on **data** and **statistical methods**.

https://en.wikipedia.org/wiki/Business_analytics



Learning Analytics?

Academic Analytics	Learning Analytics
<i>A process for providing higher education institutions with the data necessary to support operational and financial decision making*</i>	<i>The use of analytic techniques to help target instructional, curricular, and support resources to support the achievement of specific learning goals*</i>
<i>Focused on the business of the institution</i>	<i>Focused on the student and their learning behaviors</i>
<i>Management/executives are the primary audience</i>	<i>Learners and instructors are the primary audience</i>

* - Analytics in Higher Education: Establishing a Common Language

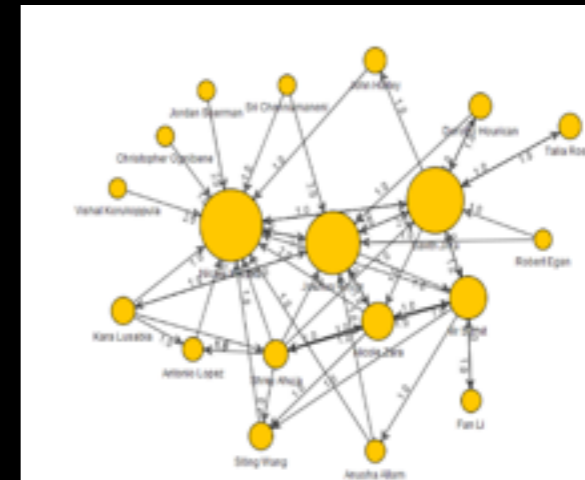


Academic Early Alert Systems

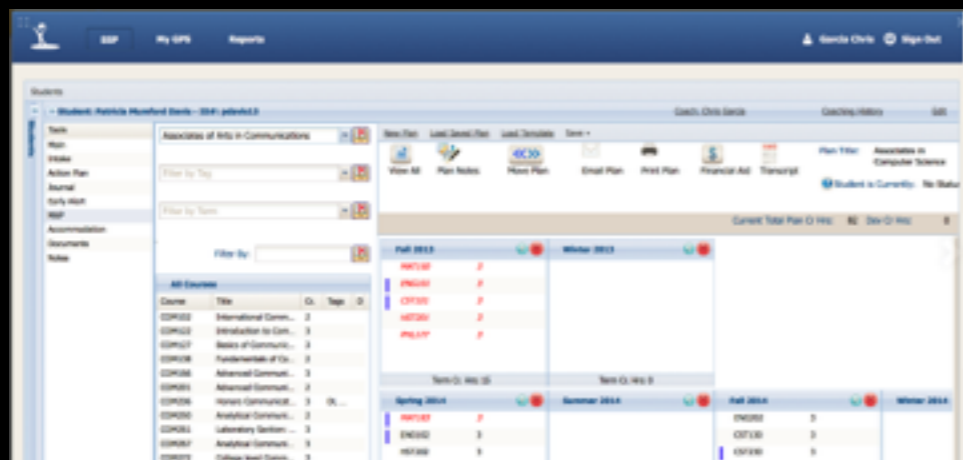
INTERVENTION Online Academic Support Environment (OASE)

SECRET CODE	COURSE	RISK CONFIDENCE
4ac4541e-9970-455c-a433-3c958719381	ACCT_2101_01_125	HIGH
09683333-3789-4932-919d-a4855c197886	ACCT_2101_01_125	HIGH
18da7ba-39b-478f-8512-6684041c491	ACCT_2101_01_125	HIGH
cc537935-d385-45d2-b8a3-9d9d2b0a75e	ACCT_2101_01_125	HIGH
8ac75706-245a-47e5-8d5f-89c1f6aa5810	ACCT_2101_01_125	HIGH
550aefb1-8e76-452f-b884-26e99643c0d8	ACCT_2101_01_125	HIGH
c5466bda-c721-400c-8489-68043d621a9	ACCT_2101_01_125	HIGH
715ba110-a454-4060-9618-8da617d94a51	ACCT_2101_01_125	HIGH
1e157738-1003-443c-b1d0-ba5dc3b7849f	ACCT_2101_01_125	MEDIUM
33374137-9a3a-429f-b8b2-87eeea40a21	ACCT_2101_01_125	MEDIUM
4220896-ba15-4919-a7e6-121b18a84c07	ACCT_2101_01_125	LOW
3db406c3-88c5-42cd-ab57-9a18800a4361	ACCT_2101_01_125	LOW
8cc4697f-a22c-49a3-939c-4a18af32339b	ACCT_2101_01_125	LOW

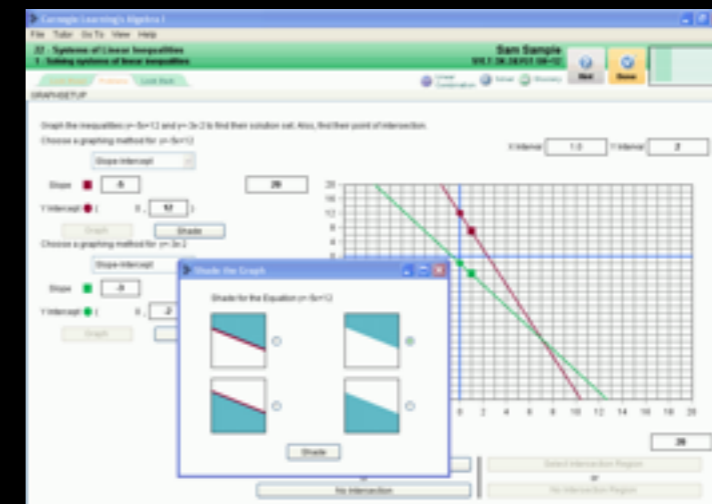
Data Visualization



Student Advising & Recommendations



Adaptive Learning & Cognitive Tutoring



Institutional Journey

Reporting Data

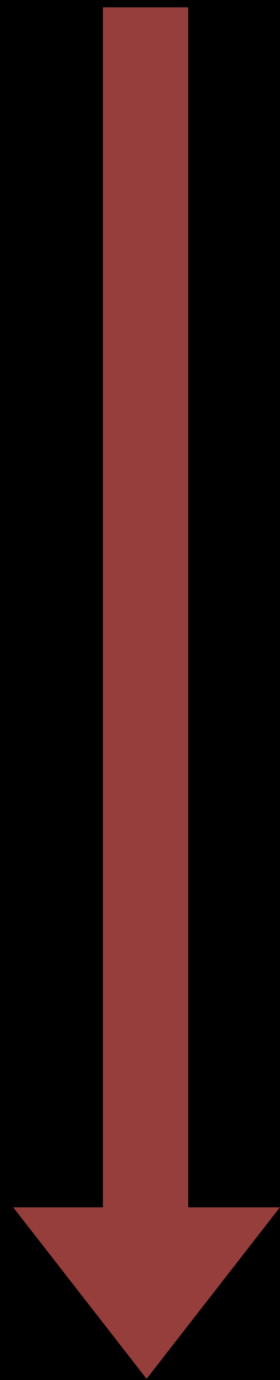
- Summarize historical data

Analyzing Trends

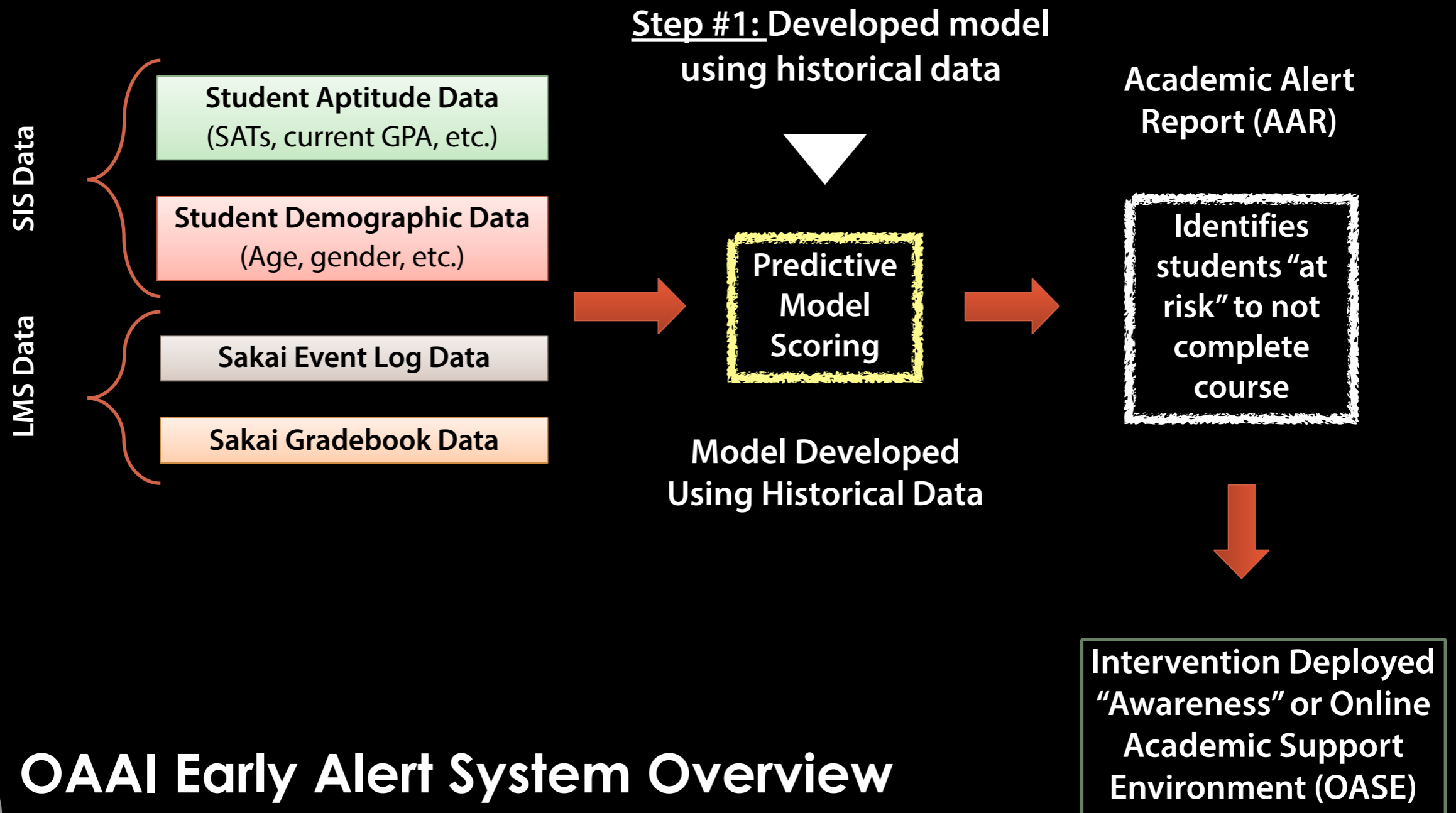
- Identify historical trends and correlations

Predictive Analytics

- Predict future outcomes and behaviour



OAAI Project - Marist College



OAAI Early Alert System Overview

OAAI Impact

- Statistically significant positive impact on final grades
- Across student population (including low income)
- Models **proved portable** - reference group of institutions
- Staff feedback -

“I became more vigilant about reaching out to individual students”

“I received the highest volume of unsolicited positive feedback”



Sharing open models and algorithms is critical to institutional learning

Strategic Vision - Open Learning Analytics Platform

Collection

based data capture from any potential source using Experience API and/or IMS Caliper/Sensor API

Storage

for all learning-related data using Learning Record Store (LRS) standard.

Analysis

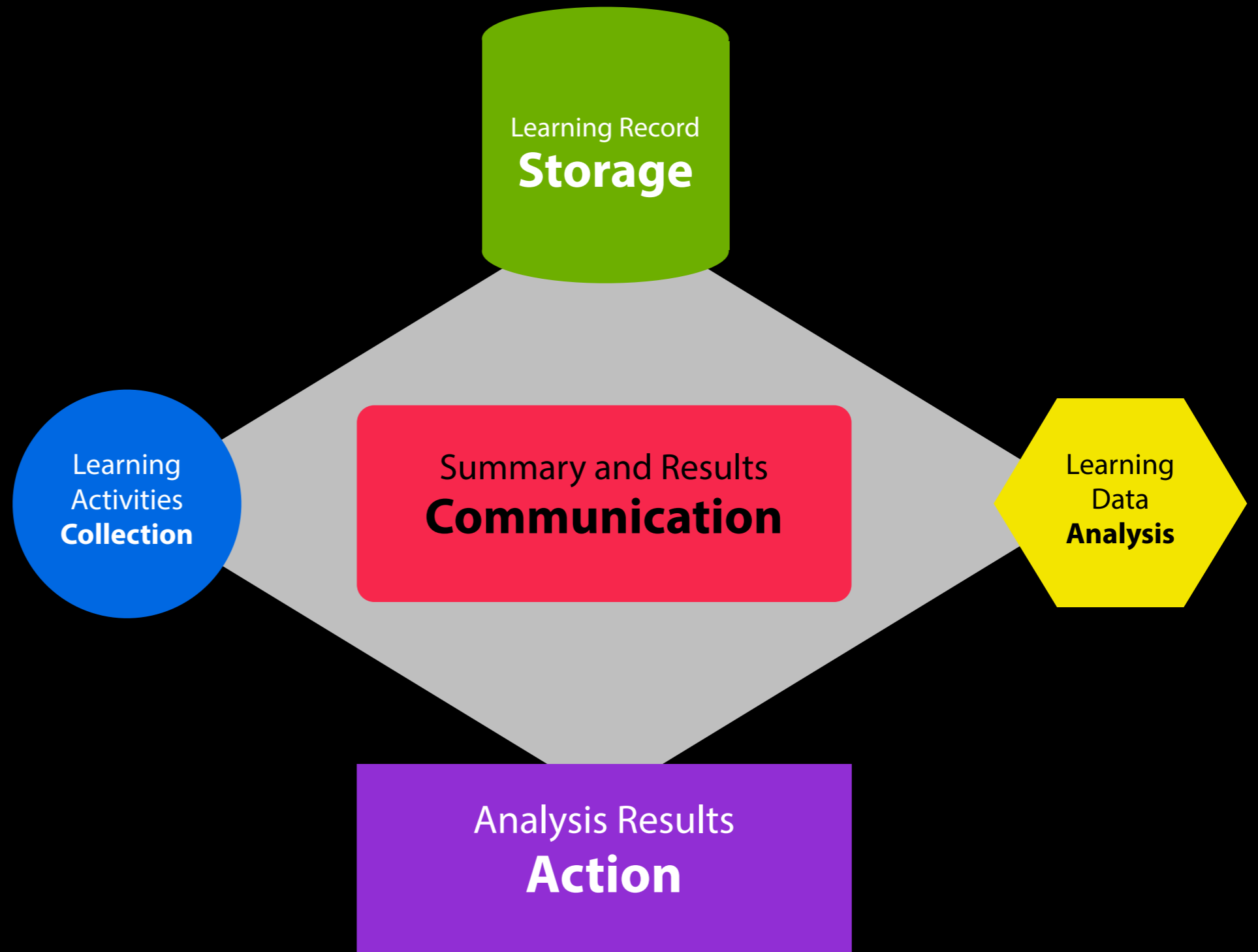
Analytics Processor (LAP) that can handle data mining, data processing (ETL), predictive model scoring and reporting.

Communication

Dashboard technology for displaying LAP output.

Action

fed into other systems to trigger alerts, etc.



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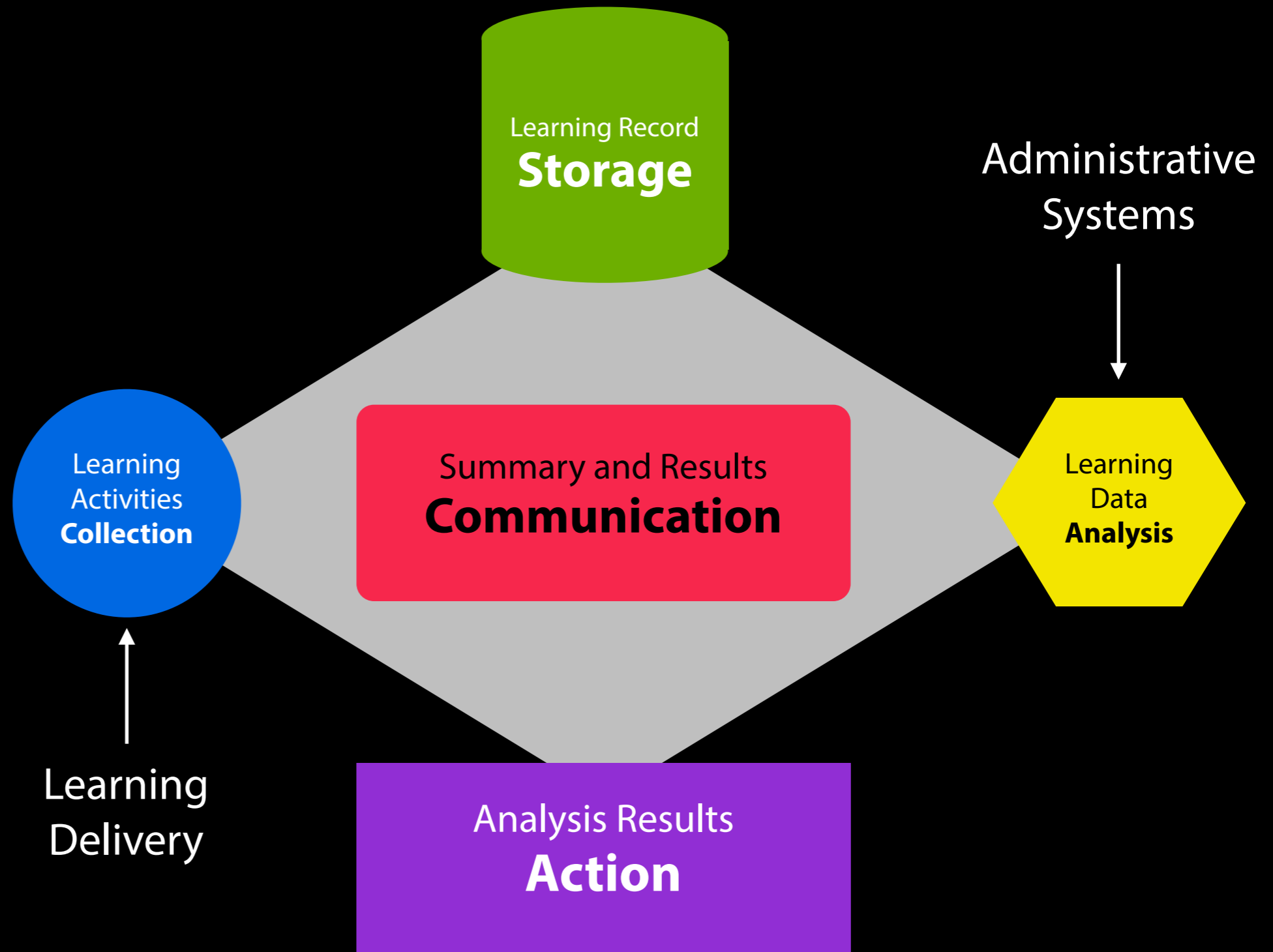
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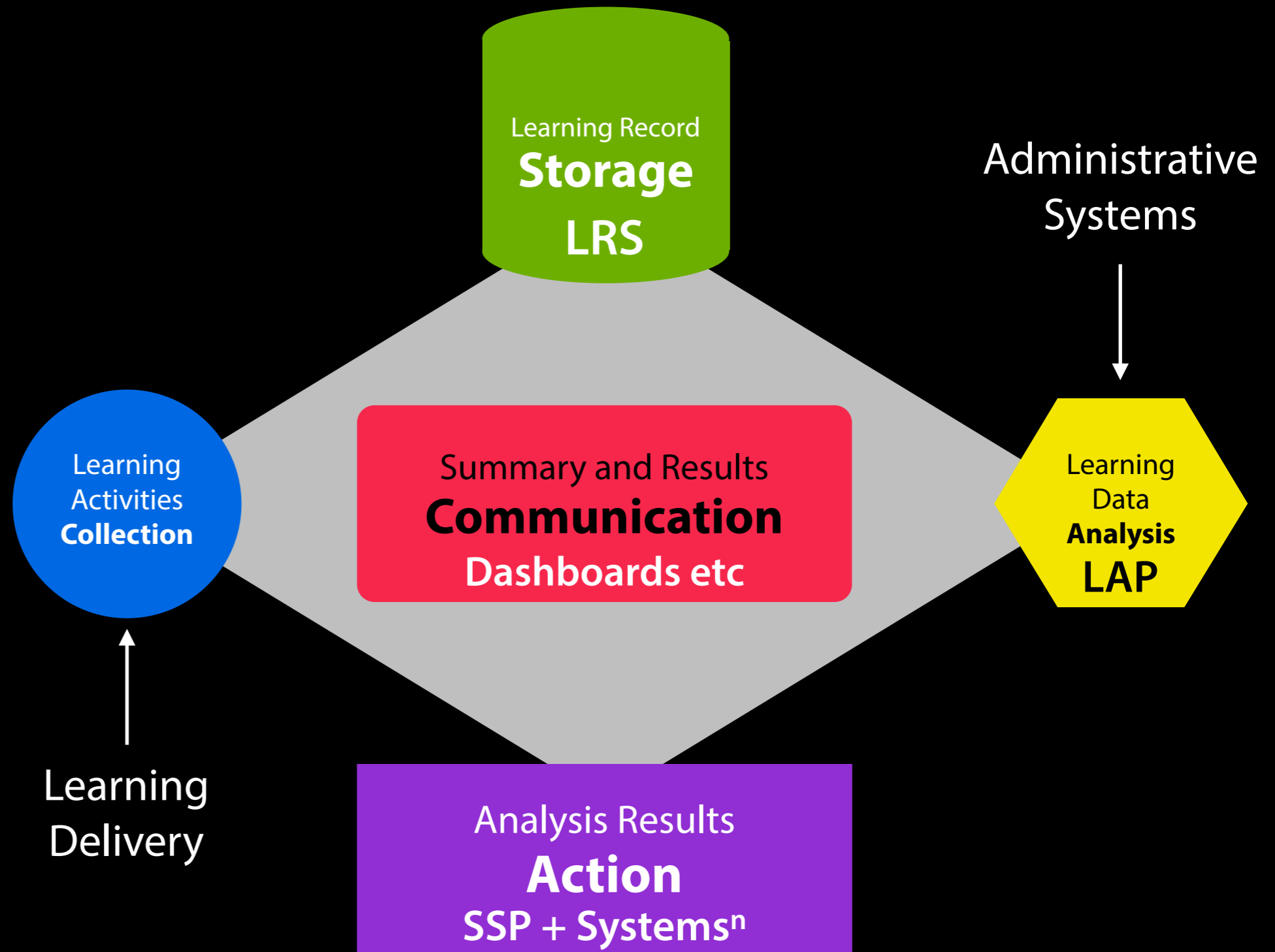
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Six Strategic Issues

(not the only six)

1. Data: from **where**?
SIS? LMS/VLE? Library? eResources? Others?
2. Systems **open enough** to extract required data?
3. Institutional **governance**?
4. Committed institutional **leadership**?
5. **Application centric** vs **Platform** approach?
6. **Ethics** and **Privacy**:
cultural and legal concerns in globalized environment



7

*Willingness and ability
to share?*

Current state ...

- **Data Collection:** xAPI integrated with Sakai, Apereo OAE, Larissa, OpenLRS. IMS Calliper exploration when mature
- **Learning Record Store (LRS):** Two reference implementations - OpenLRS (Unicon, USUHS) Larissa (UvA)
- **Learning Analytics Processor (LAP):** Reference implementation of API (Unicon/Marist)
- **Open Dashboard:** Reference implementation (Unicon/USUHS). IMS LTI compliant - embed in many systems
- **Student Success Plan:** Case Management - Graduated incubation, growing number of adoptions

Futures

- Move elements of platform into **incubation**
- Encourage **use, experimentation, adoption**
- Encourage **resource commitment**
- Encourage **regional exchanges**
- **Networking:** JISC Analytics, SoLAR. SURF, MINES ??
- **Participate**

LAK15

5th International Learning Analytics and Knowledge Conference

SOLAR
SOCIETY for LEARNING
ANALYTICS RESEARCH

MARIST



Marist College, Poughkeepsie, New York, USA
March 16 - 20, 2015 ● lak15.solaresearch.org



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