Playing well together: Trends in integrating with cloud SaaS applications

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ExLibris
a ProQuest Company

Abstract

As more of our business-critical software moves to the cloud, organizations have had to find new ways to provide services to users while data and workflows reside in cloud-based systems. We'll look at some trends and best practices for integrating with such systems, and how they apply to Ex Libris SaaS products.

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KEY TRENDS IN INTEGRATING WITH CLOUD SAAS SYSTEMS

1

2

3

4

5

Cloud SaaS Systems

API All the Things

Adopt Standards

Community, Community, Community

Leverage the Public Cloud

The move to the cloud is well reported

Transition from direct access to data and workflows to access via APIs

Standards allow turnkey interoperation between systems

Living in the cloud together opens new opportunities for collaboration and sharing

Take advantage of low cost public cloud infrastructure to run local processes

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Cloud SaaS Systems

Trends in SaaS Applications

- Mainstream adoption achieved

- Spreading to additional vertical markets

- Identified by Gartner as approaching the "plateau of produc-tivity"

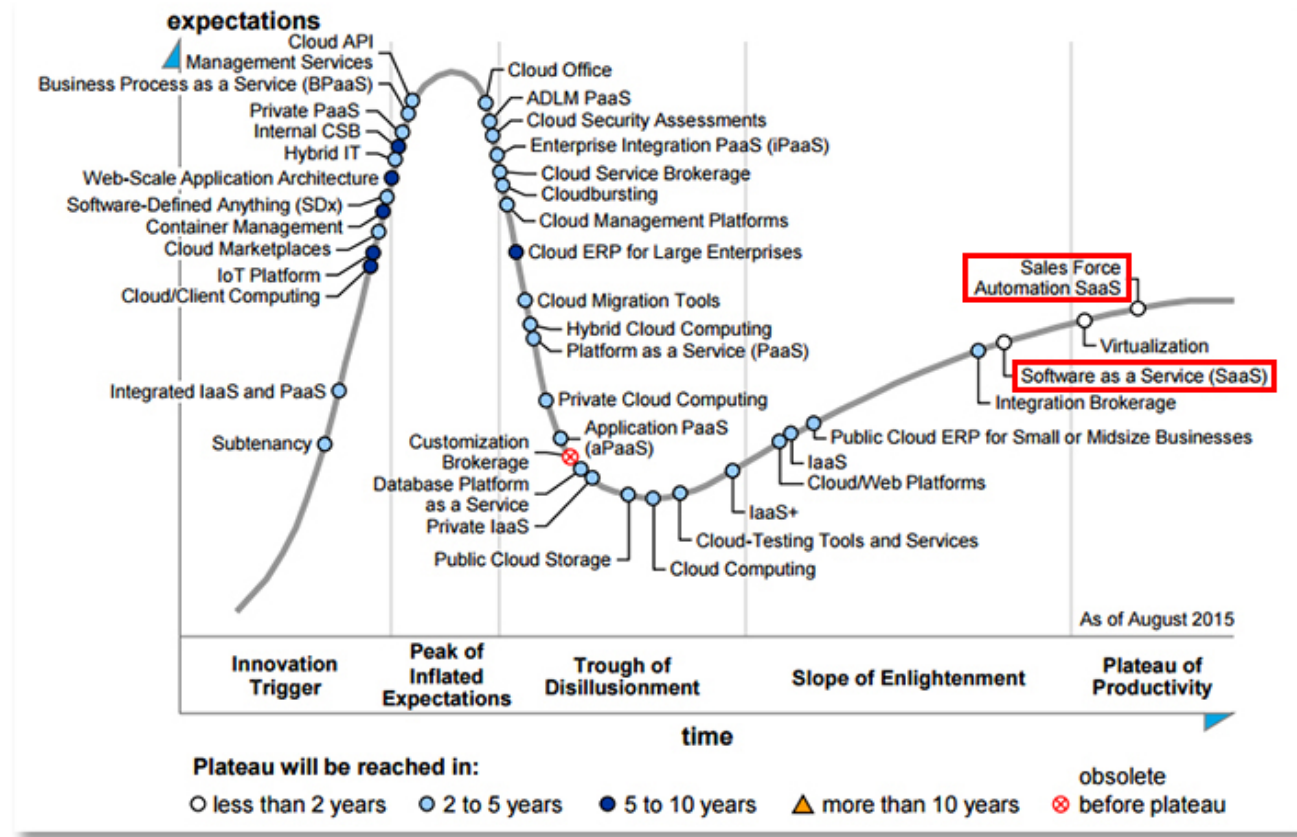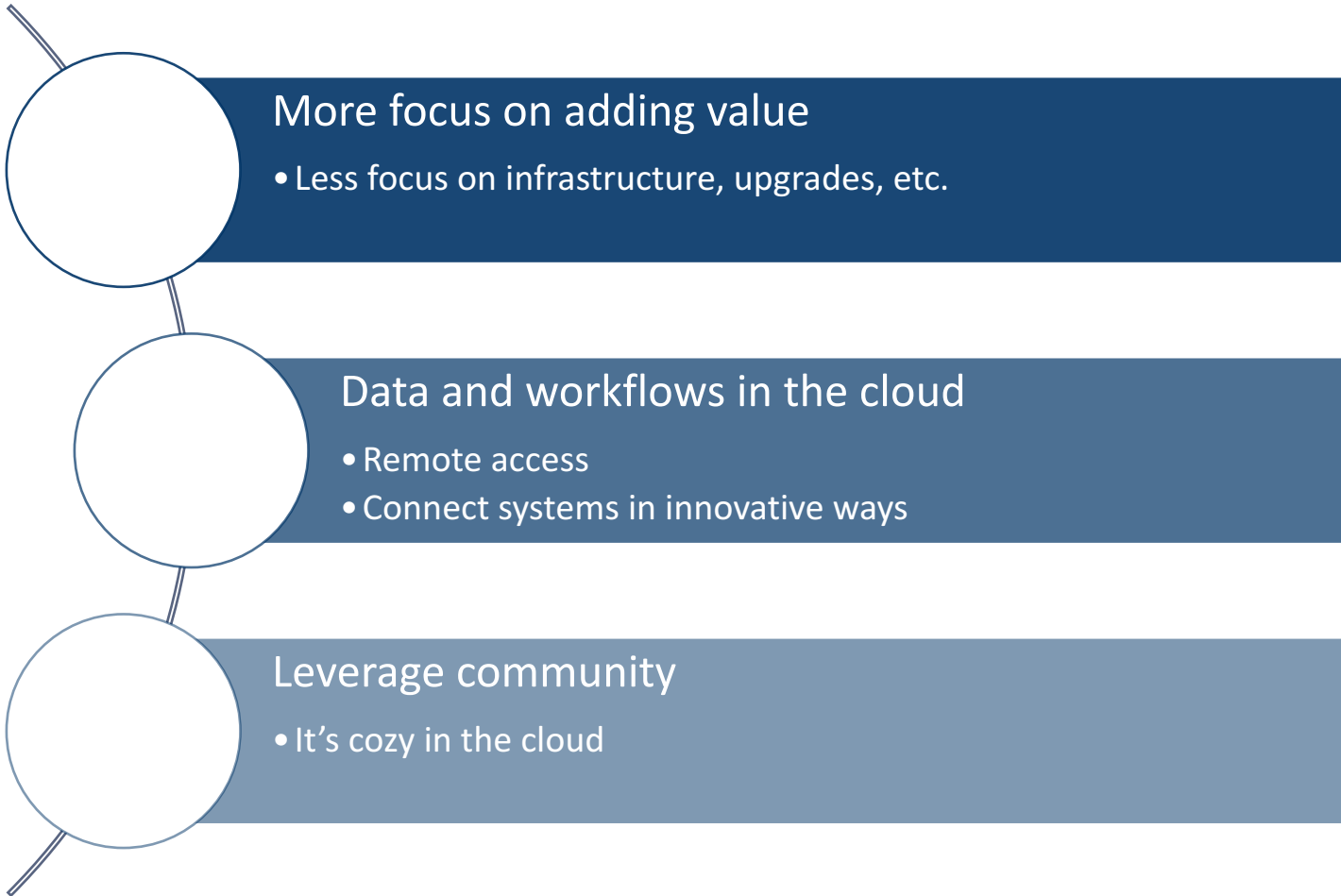## Gartner Hype Cycle for Cloud Computing, 2015

expectations

Cloud API
Management Services
Business Process as a Service (BPaaS)
Private PaaS
Internal CSB
Hybrid IT
Web-Scale Application Architecture
Software-Defined Anything (SDx)
Container Management
Cloud Marketplaces
IoT Platform
Cloud/Client Computing

Cloud Office
ADLM PaaS
Cloud Security Assessments
Enterprise Integration PaaS (iPaaS)
Cloud Service Brokerage
Cloudbursting
Cloud Management Platforms
Cloud ERP for Large Enterprises

Cloud Migration Tools
Hybrid Cloud Computing
Platform as a Service (PaaS)

Sales Force Automation SaaS
Virtualization
Software as a Service (SaaS)
Integration Brokerage

Integrated IaaS and PaaS

Subtenancy

Customization Brokerage
Database Platform as a Service
Private IaaS

Private Cloud Computing
Application PaaS (aPaaS)

Public Cloud ERP for Small or Midsize Businesses
IaaS
Cloud/Web Platforms
IaaS+
Cloud-Testing Tools and Services

Public Cloud Storage
Cloud Computing

As of August 2015

Innovation Trigger	Peak of Inflated Expectations	Trough of Disillusionment	Slope of Enlightenment	Plateau of Productivity

time

Plateau will be reached in:
○ less than 2 years   ○ 2 to 5 years   ● 5 to 10 years   △ more than 10 years   obsolete ⊗ before plateau

Image: Gartner

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What does this mean to me?

What are the implications of this move?

More focus on adding value
- Less focus on infrastructure, upgrades, etc.

Data and workflows in the cloud
- Remote access
- Connect systems in innovative ways

Leverage community
- It's cozy in the cloud

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API All the Things

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When your application runs in the cloud, access to data and workflows via APIs is essential.

Ex Libris REST APIs standards are meant to provide a unified experience for developers.

Alma provides a rich set of APIs in major subject areas.

REST API Features

Modern REST Principles

- HTTP Verbs
- Status Codes

JSON/XML Support

- WADLs & XSDs
- Content-Type

Authentication & Authorization

- API Key
- Self-service via Dashboard
- Limit access by API Subject Area
- Specify read/write and environment access

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Alma APIs

ALMA API GROWTH

Legend: /acq/ | /analytics/ | /bibs/ | /conf/ | /courses/ | /partners/ | /users/ | /task-lists/ | /electronic/

Alma APIs Subject Areas

Alma APIs Subject Areas

- **Analytics** – run Alma analytics reports

- **BIBs** – catalog, inventory, fulfillment, collections, digital

- **Configuration** – jobs, sets, configuration

- **Courses** – reading lists, citations

- **Electronic Resources** – e-collection, portfolios

- **Users** – user data, loans, requests, fines, deposits

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Continually Increasing USAGE

Now over
2,00,000
API Calls per Day!

Legend: Acq, Analytics, Bib, Conf, Courses, Partners, Users

Y-axis: 0, 5,000,000, 10,000,000, 15,000,000, 20,000,000, 25,000,000

X-axis: FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV

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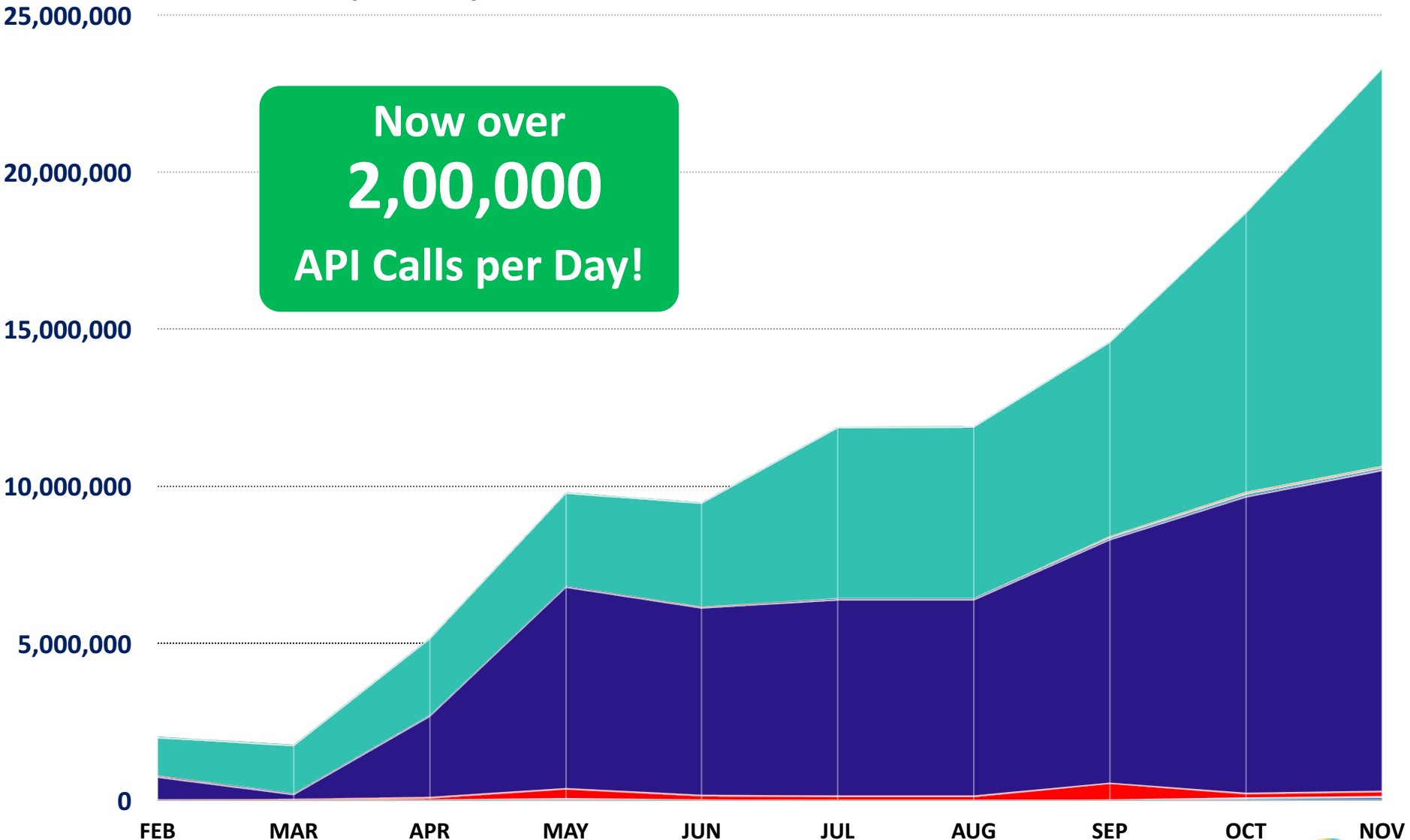
APIs as a Proportion of Total System Usage
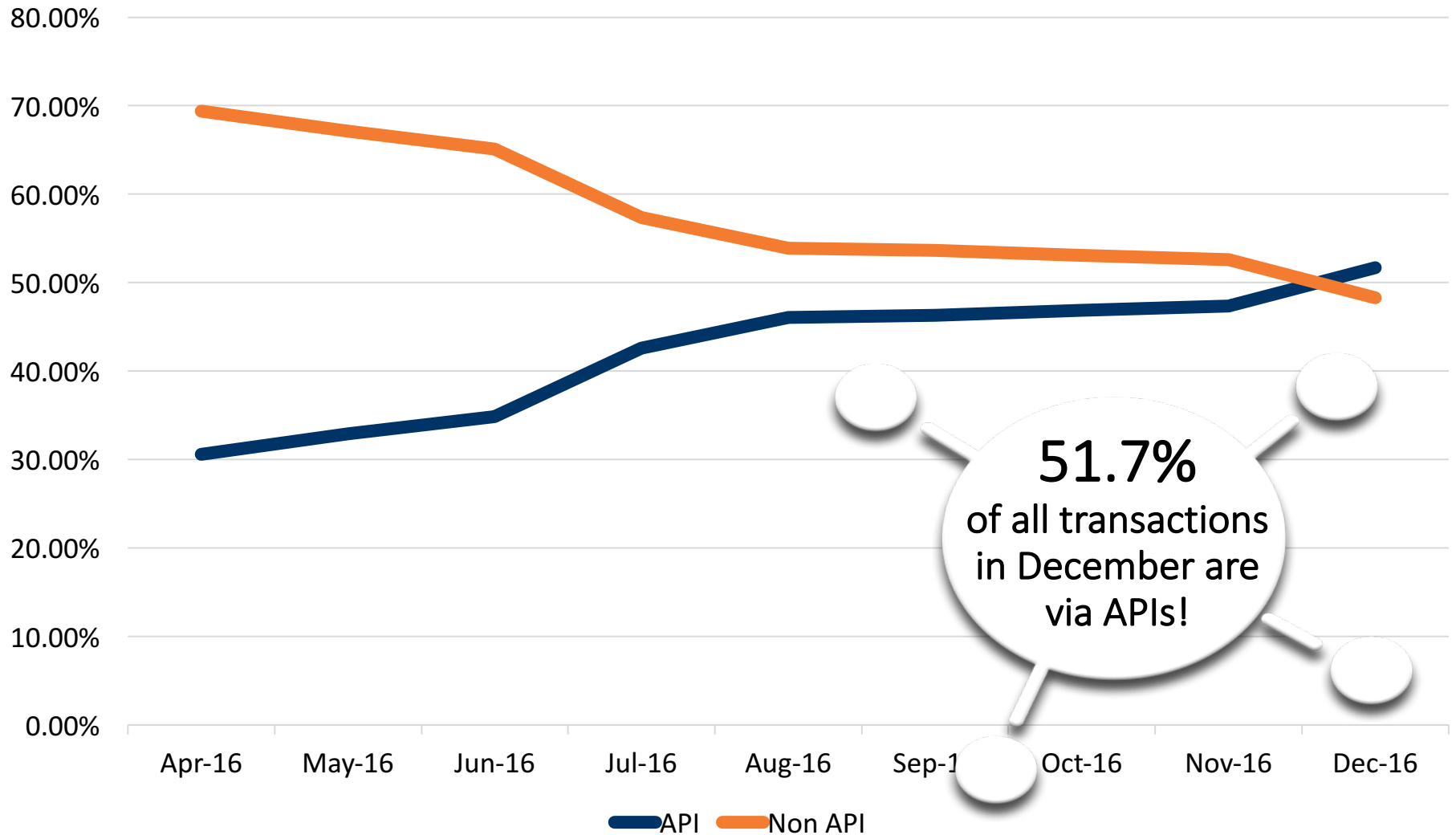
51.7%
of all transactions in December are via APIs!

Legend: API, Non API

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Interactive Documentation

API Documentation

- For each API endpoint
- URL parameters
- Querystring parameters
- Error codes
- Input and return object types

Data dictionary

- Field description
- Data type
- Length/optional
- Special instructions

Institutional Data

- Institution- defined data
- Information in the hands of devs

Interactive Console

- Try API calls within minutes
- Code samples

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Adopt Standards

Standards allow for turnkey integration between systems without custom development.

Standards promote interoperability.

Wherever industry standards exist Ex Libris prefers to adopt them rather than reinventing the wheel.

Alma Integrations

Integrations

CAS	CMS	EDI	ERP
LDAP	JSON-LD	NCIP	OAI-PMH
OAuth	RDA/RDF	RFID	SAML2
SIP2	SIS	SRU	SWORD
z39.50			

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Community, Community, Community

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Using a SaaS system means everyone is on the same version. This encourages collaboration and cooperation.

Customers can share tips & tricks, code samples, workflows, integration scenarios, etc.

The Ex Libris Developer Network encourages community sharing. Ex Libris contributes to open source and works to facilitate the community.

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Developer Network - Blog

Blog

for sharing code, apps, and technical tips & tricks

Developer Network - Forum

Forum

for getting help with technical integrations

Transparency at Ex Libris
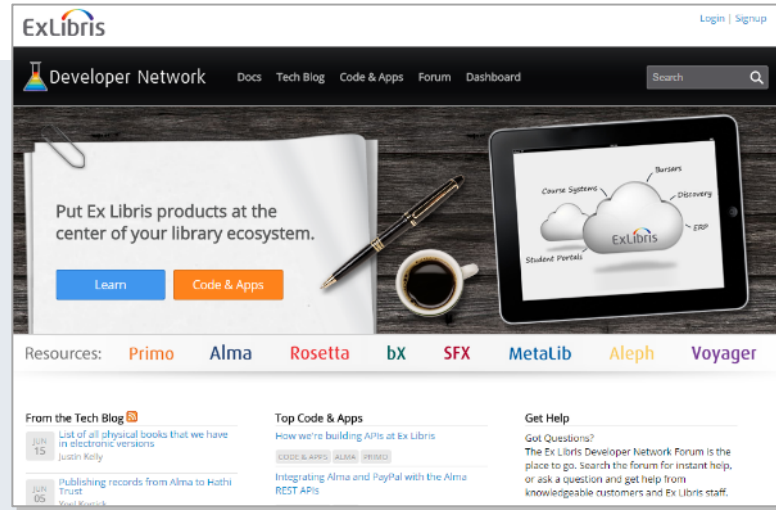
Developers Network
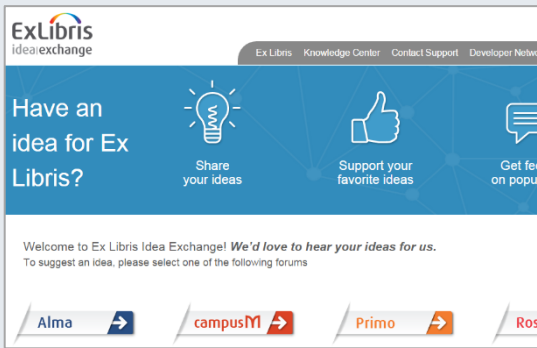
Ideas
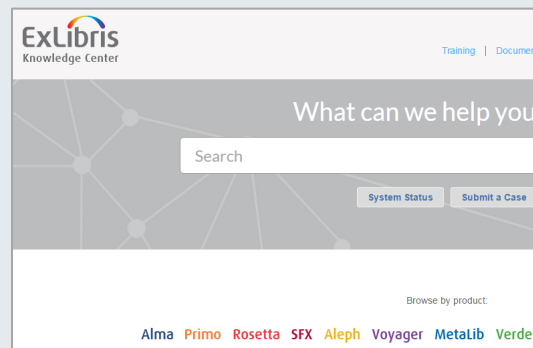
Knowledge
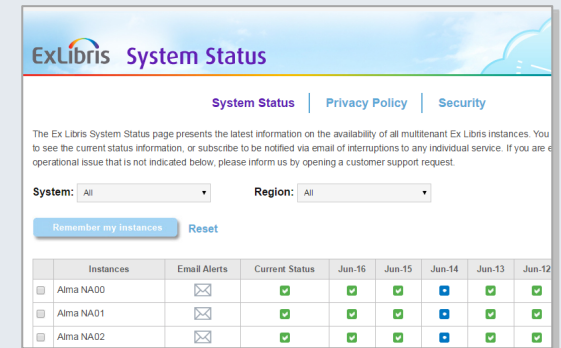
Status

Developer Network Active Usage
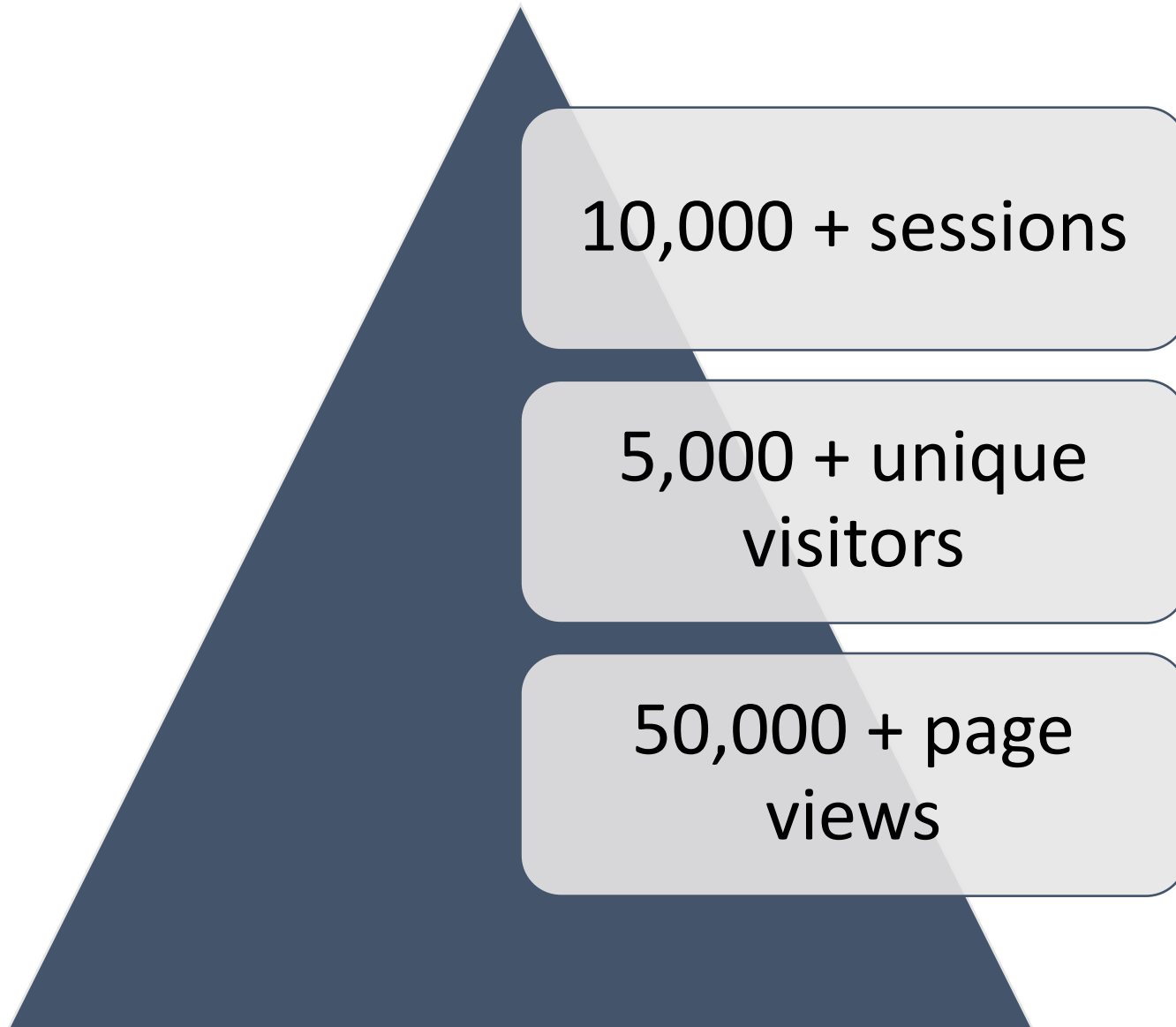
10,000 + sessions

5,000 + unique visitors

50,000 + page views

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Developer Community

- Active blog & forum
  - 6-8 per month
  - 50% by community

Blog Entries per Month by Product
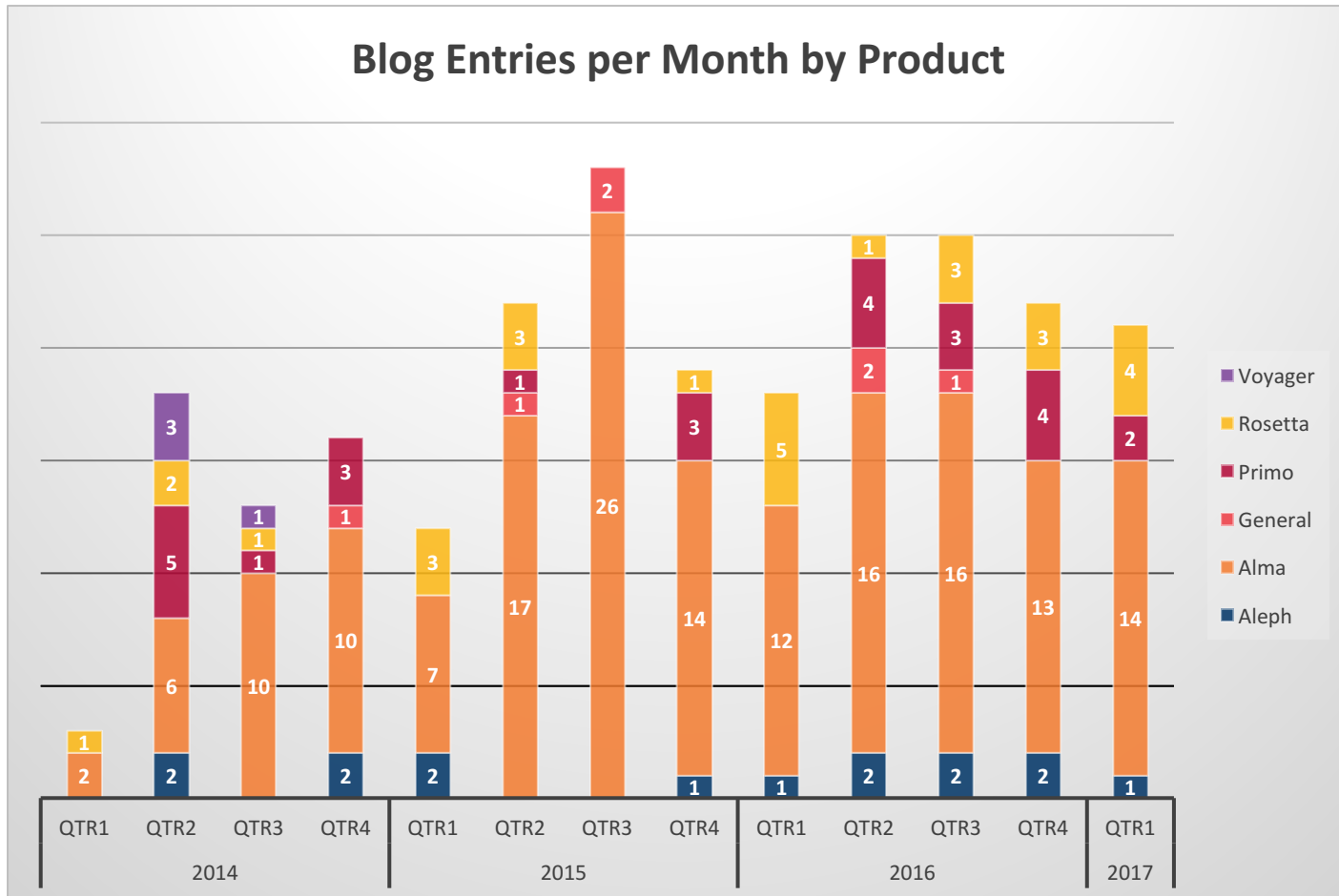
- Ex Libris maintains a presence on Github to share integration demos, code samples, plugins, and collaborative projects

- Notable examples- Primo new UI toolkit, Rosetta plugins, Alma migration tools, Alma/Blacklight sample integration, Tableau Web Data Connector

Ex Libris Github

https://github.com/ExLibrisGroup

Leverage the Public Cloud

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Leveraging the Public Cloud

Even when enterprise systems move to the SaaS model, local applications and integrations need to be hosted.

Want to avoid maintaining infrastructure, patching, upgrading.

The public cloud provides a cost-effective, secure and robust platform on which to build integrations.

Ex Libris is committed to ensuring its SaaS applications "play nicely" in this environment.

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A few Public Cloud options

- **Amazon Web Services (AWS):** The "big gorilla" in the industry, provides both infrastructure-as-a-service (IaaS) and platform-as-a-service (PaaS)

- **Microsoft Azure:** strong competitor to AWS, supports both Windows and Linux and many languages

- **Heroku:** A subsidiary of Salesforce, interesting platform-as-a-service option

Serverless Computing (PaaS)

Serverless computing … is a [cloud computing](#) code [execution](#) model in which … requests are billed by an abstract measure of the resources required to satisfy the request, rather than per virtual machine, per hour.

Despite the name, it does not actually involve running code without servers.[1] The name "serverless computing" is used because the business or person that owns the system does not have to purchase, rent or provision servers or virtual machines for the [back-end](#) code to run on.

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

Image: http://blog.form.io/what-are-serverless-apps-and-what-do-they-mean-for-developers

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Serverless Computing (PaaS)

- **AWS Lambda**: Deploy and run functions (i.e. Node or Java code)

- **AWS Elastic Beanstalk:** Deploy and run applications (i.e. Ruby on Rails or Java/Tomcat)

- **Heroko Dynos:** Deploy and run applications (i.e. Node.js)

- **Azure Logic Apps:** Deploy and run functions (i.e. C# or Node code)

- **Azure Web Apps:** Deploy and run applications (i.e. ASP.NET MVC or ASP.NET Core)
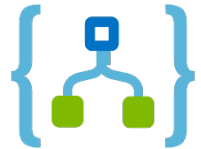
Public Cloud Blogs

- [Leveraging the public cloud: Sending notifications to patrons](#)
  AWS Lambda

- [Getting Started with Webhooks in Alma](#)
  Heroku

- [Hosting a Webhook Listener in AWS](#)
  AWS Lambda, AWS API Gateway

- [Hosting a C# Webhook Listener in Azure](#)
  Azure Web App

- [Real Time Notifications with Alma Webhooks](#)
  Heroku, Mongo

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More on the Way…
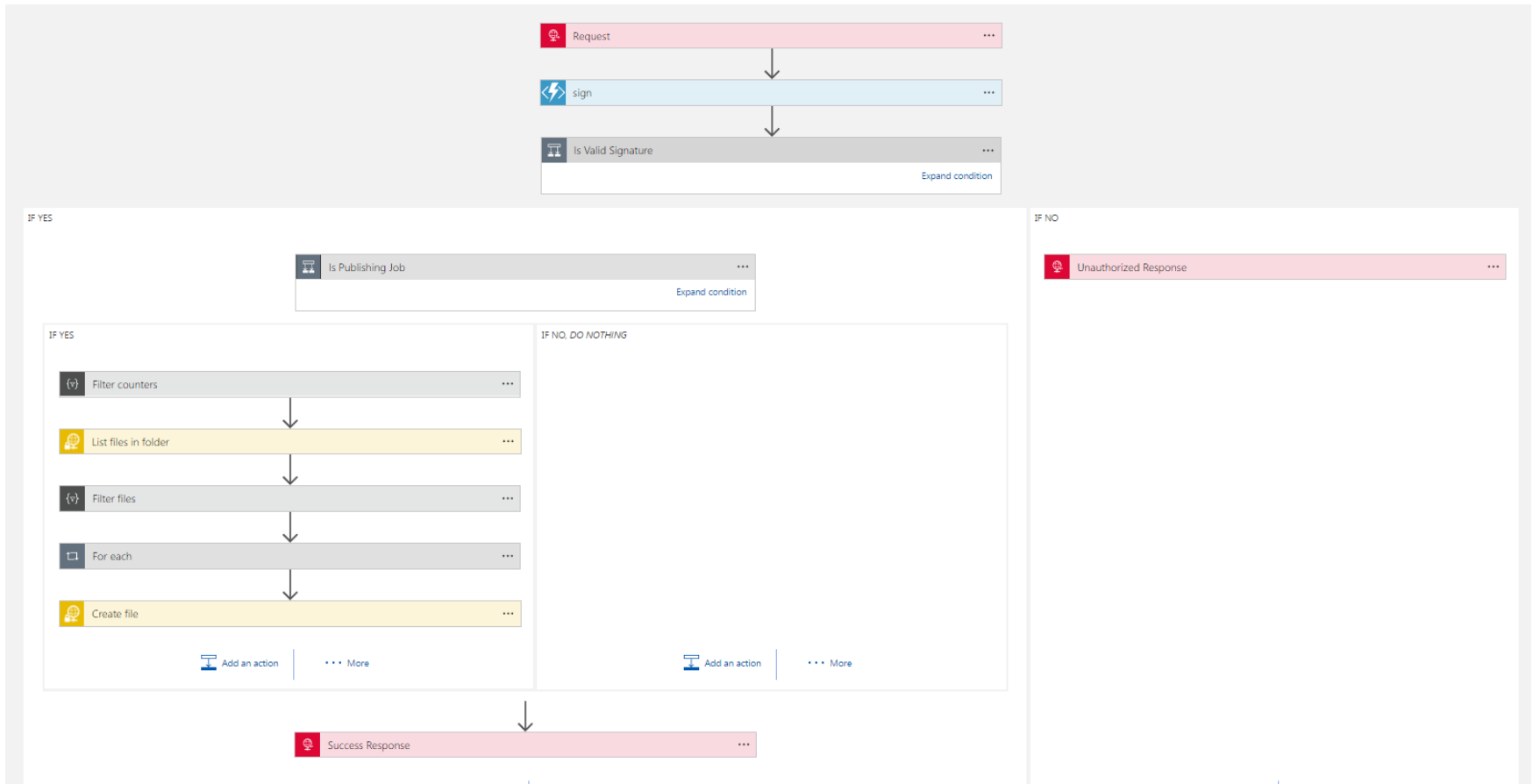
Azure Logic Apps

Summary

Linked Data Support in Alma

- Exposing millions of records in linked data format
- Automatic enrichment

Webhooks

- Changes programming paradigm from pull to push
- Enabling real-time interaction with Alma

Tableau Web Data Connector

- Access Alma data in Tableau
- Collaboration with the community
- Combine with data from other sources

The move to the cloud provides us with some challenges but many opportunities to increase **efficiency**, **collaboration**, and continue to **add value** to our organizations.

Ex Libris provides support for **standard protocols** and **REST APIs** to allow customers to **extend** its solutions and continue to create innovative **integrations**.

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THANK YOU!
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