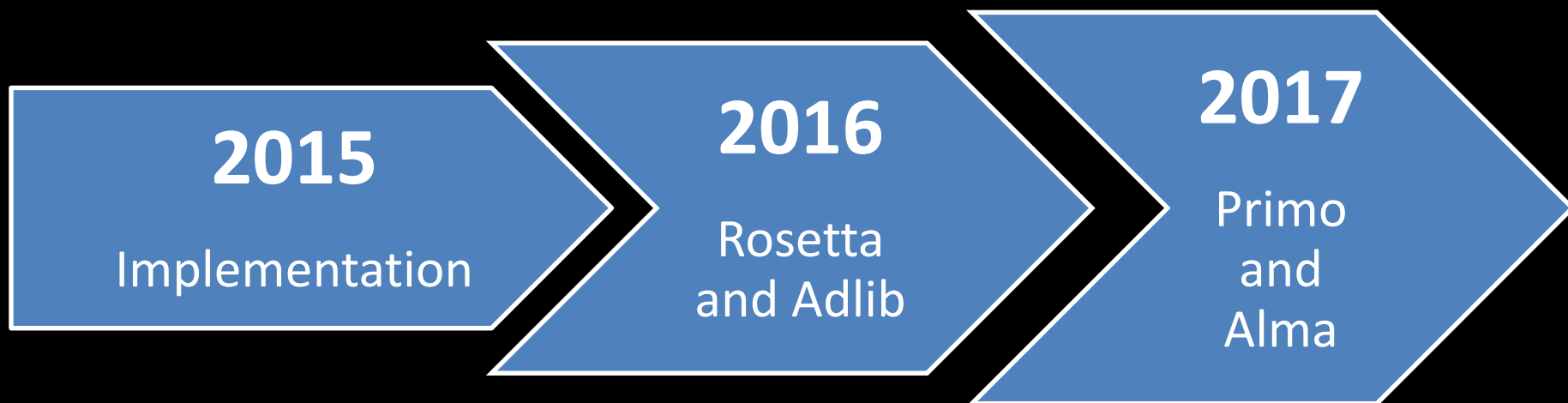# Using APIs to enhance the User Experience

ANZREG 25 October 2019
Developers Day

Euwe Ermita, Manager Digital Library Systems and Services

State Library of New South Wales

STATE LIBRARY®
NEW SOUTH WALES

Systems implementation timeline

2015

Implementation

2016

Rosetta and Adlib

2017

Primo and Alma

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Ex Libris Primo

Discovery, end user search and content delivery

↓ Harvests record metadata   ↓ Harvests record metadata

Ex Libris Alma

- Collection Management Print and Electronic resource management
- Authority control
- Serials management
- Fulfillment

AdLib

Hierarchical archival collections and findings aids management, circulation, tracking and display for both digital and physical objects

↕ Published record linked to digital asset   ↕ Unpublished/archival record linked to digital asset

Ex Libris Rosetta

External collection viewer

Viewers for images, Downloads for PDFs, ePubs

Staff administration

Digital Asset Management, Ingestion Deposit, Digital Preservation
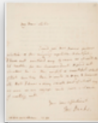
Primo UI customisation

Adlib UI customisation

MANUSCRIPTS, ORAL HISTORY
AND PICTURES CATALOGUE

HOME | MY LIST | SEARCH HISTORY | SEARCH TIPS

Search keyword(s)   Advanced search

● All   ○ Digital content   ☐ Search within results
Search in ☑ Catalogue ☐ Manuscript Index

RESULTS   52650 records

Results for: *sydney Digital content*   ‹ **1** 2 3 4 5 6 7 8 9 ›

⬇ DOWNLOAD RESULTS   🖨 PRINT

☐

TITLE: **Series 27.13: 'Extract of a Letter from Mr Geo Bass to Lieut. Colonel Patterson [sic]...Reliance, Sydney Cove...', 20 August 1797**

LEVEL OF DESCRIPTION: item

DATE OF WORK: 20 August 1797

TYPE OF MATERIAL: Textual Records

CALL NUMBER: SAFE/Banks Papers/Series 27.13

ISSUE COPY: Digitised:

Adlib UI customization - hierarchies

VIEW MEDIA FILES

BROWSE COLLECTION HIERARCHY

□ Aggregated collection (Contains 96 series)
Sir Joseph Banks Papers, 1767-1822. Includes some papers of Sarah Sophia Banks, 1766, 1773-1774, 1779; and Dorothea, Lady Banks, 1817-1822. |

Series 01: Journal of an excursion to Chatham, Rochester, Sheerness and Sheppey, 21 [February] - 4 March 1767 | SAFE/Banks Papers/Series 01.01 (Safe 1 /457)

Series 02: Journal of a tour in Holland, 12 February - 22 March 1773 | SAFE/Banks Papers/Series 02.01 (Safe 1/457)

□ Series (Contains 2 items)
Series 03: Joseph Banks - Endeavour journal, 25 August 1768 - 12 July 1771 |

Series 03. 01: Volume 1: Joseph Banks - Endeavour journal, 25 August 1768 - 14 August 1769 | SAFE/Banks Papers/Series 03.01 (Safe 1/12)
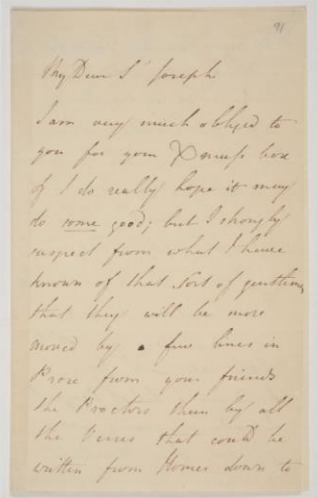
⊞ Item (Contains 1 Part)
Series 03. 02: Volume 2: Joseph Banks - Endeavour journal, 15 August 1769 - 12 July 1771 | SAFE/Banks Papers/Series 03.02 (Safe 1/13)

Series 04: Notes possibly concerning publication of the account of the voyage of HM Bark Endeavour, James Cook, undated. | SAFE/Banks Papers/Series 04.01 (Safe 1/457)

Rosetta viewer UI customisation

But reader experience is still inconsistent…

Library Website

Catalogue (Primo)

Collection Viewer

Archival Catalogue (Adlib)

eResource Directory

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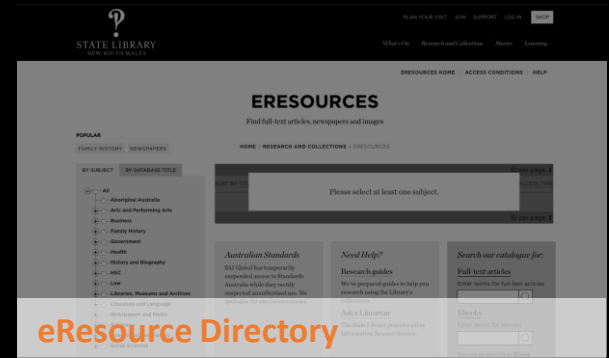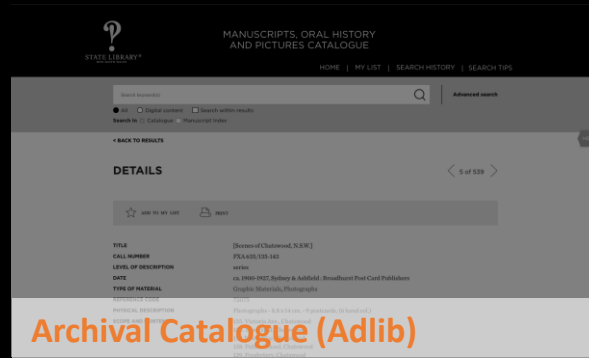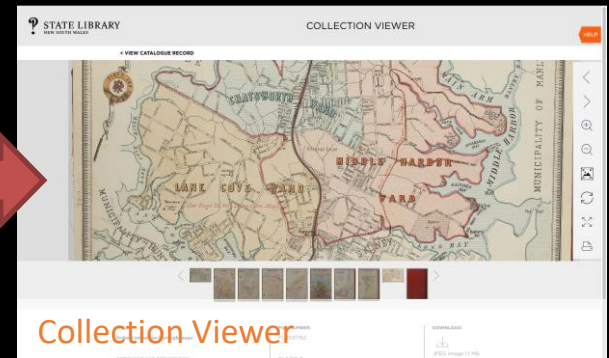
Challenges

- User experience - Fractured journey across catalogues

- Hierarchies of Archival collections not in Primo. Archival catalogue not easy to navigate.

- Findability – Lack of Google indexing of Primo

- Customisation of interfaces – limited or restricted

- System performance – slow for large collections

- Downtime – release updates across products (monthly, quarterly), breaking changes

Options…

```
Switch ($recommendedOption) {

        case "doNothing" :
                /* manage expectations of our users/readers */
                break; // and hide from users

        case "continueConfiguringOOTBInterfaces" :
                /* are we at the point of diminishing returns?? */
                break;

        case "decoupleUserInterfaces" :
                /* Decouple monoliths – Systems of Records from UI */
                initiateProject();
                break;

        default:
                echo "Analysis paralysis";
}
```

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Application Portfolio Management Strategy: Pace Layering

"I don't know exactly what I want. I need to experiment."

Systems of Innovation

"I know exactly what I want, but it needs to be different from my competitors."

Systems of Differentiation

"I know exactly what I want, and it doesn't have to be unique."

Systems of Record

Image: Boat construction on slipway - Stockton, NSW

Application Portfolio Management Strategy:
Pace Layering: Systems of Record

Systems of Innovation

Systems of Differentiation

Image: Boat construction on slipway - Stockton, NSW

Application Portfolio Management Strategy: Current state 2018

Systems of Innovation

Primo

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Amplify

Transcripts

AXIELL
ARCHIVE, LIBRARY & MUSEUM

Rosetta

Alma

Image: Boat construction on slipway - Stockton, NSW

Application Portfolio Management Strategy: Future state 19/20

Systems of Innovation

New UI

New UI

Primo

STATE LIBRARY® NEW SOUTH WALES
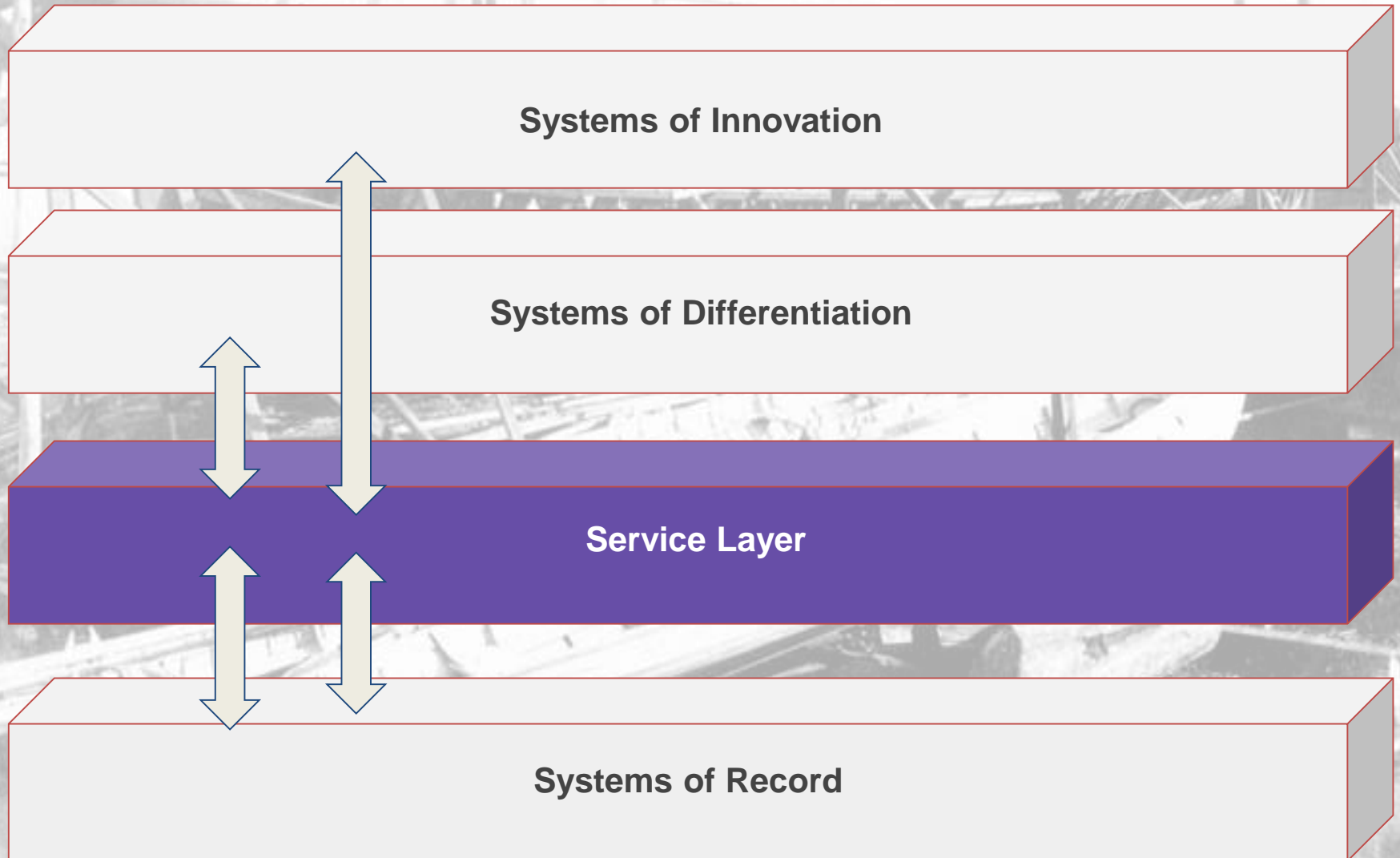
Amplify

Transcripts

AXIELL
ARCHIVE, LIBRARY & MUSEUM

Rosetta

Alma

Image: Boat construction on slipway - Stockton, NSW

Application Portfolio Management Strategy:
Pace Layering: Service Layer

Systems of Innovation
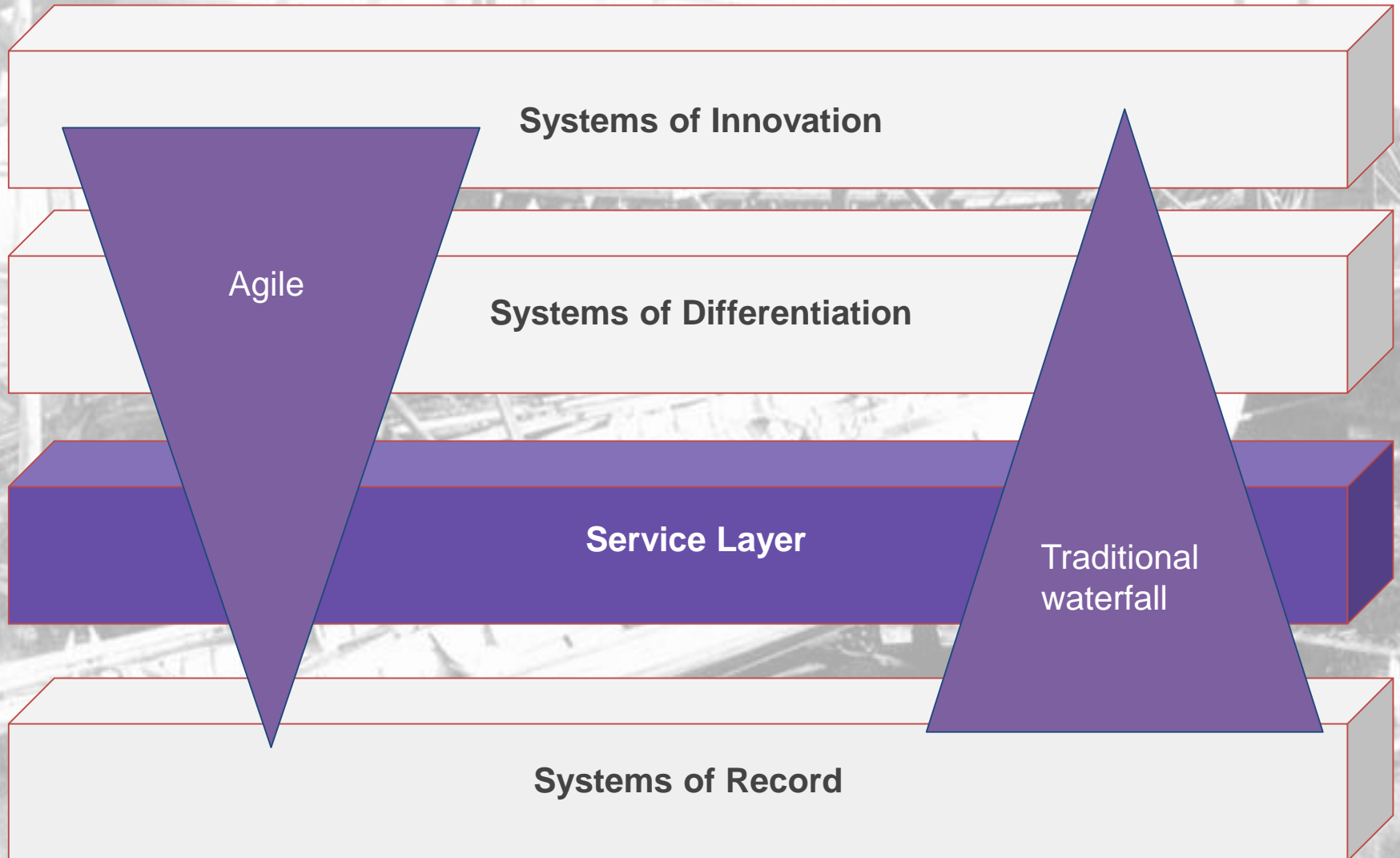
Systems of Differentiation

Service Layer

Systems of Record

*Image: Boat construction
on slipway - Stockton,*

Application Portfolio Management Strategy:
Pace Layering: Service Layer

Systems of Innovation

Agile

Systems of Differentiation

Service Layer

Traditional waterfall

Systems of Record

Image: Boat construction on slipway - Stockton,

Category	Attributes	Systems of Record	Systems of Differentiation	Systems of Innovation
General Principles	**Driving Force**	**Common Ideas**	**Better Ideas**	**New Ideas**
	Business Processes	Well-understood, highly integrated and commoditised, interdpendent, stable	Well-understood, highly configurable and customisable; autonomous	Unique, not well-understood, experimental, ambiguous, dynamic and ad hoc
	Pace of Change	Slow, infrequent, incremental; changes every six to 12 months	Moderate, more frequent, configurability is key - Changes every three to six months	Rapid, frequent and ad hoc; "throwaway" customisation; changes weekly, sometimes daily
	Security	Tightly controlled, managed complexity	Distributed control, manageable complexity	Federated control, high potential complexity
	Lifetime - how long it usually stays in that layer	More than 10 years	Two to five years	Three to 12 months
	Planning Horizon - How long you describe the plan in application strategy	More than 7 years	One to two years.	As long as six months
Business Aspects	**Strategic Focus**	Standardisation: operatonal efficiency. "**Run the business**"	Agility/flexibility; competitive differentiation; **"Grow the business"**	Disruptive thinking; alternative business models, market leadership; "**Transform the business**"
	Stakeholders/Ownership	High business executive engagement and alignment between business and IT strategy; low end-user engagement; formalo handover from business to IT	High business executive engagement, but driven by lines of business; moderate end-user engagement; business engaging on hot spots and IT filling the gaps	Moderate business executive engagement, some sponsored and under-the-radar, tactival; high end-user engagement
	Data/information	Highly structured, well-managed	Internal and external, some unstructutured; more dynamic	Structured and unstructured data; heavy reliance on external data
	Risk	Minimum	Medium	High

Monolithic vs decoupled interfaces

User interface
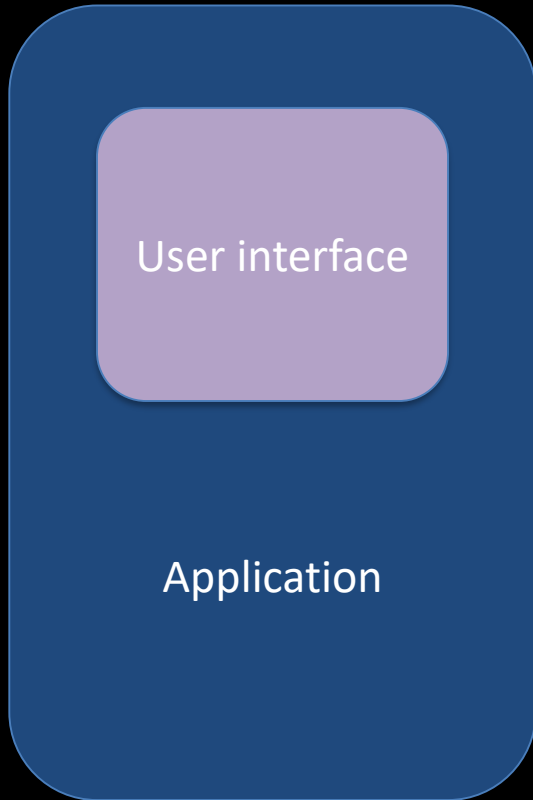
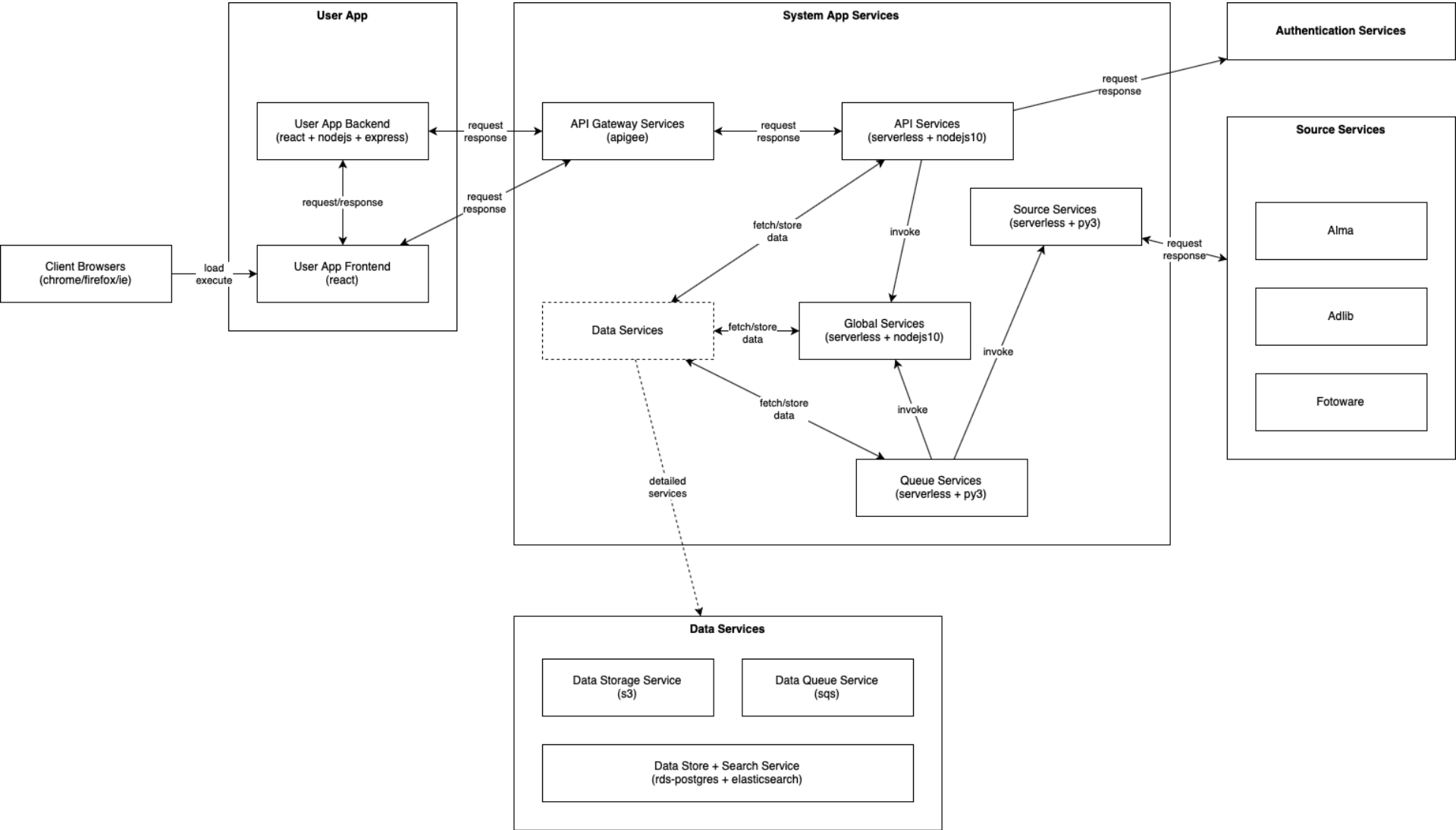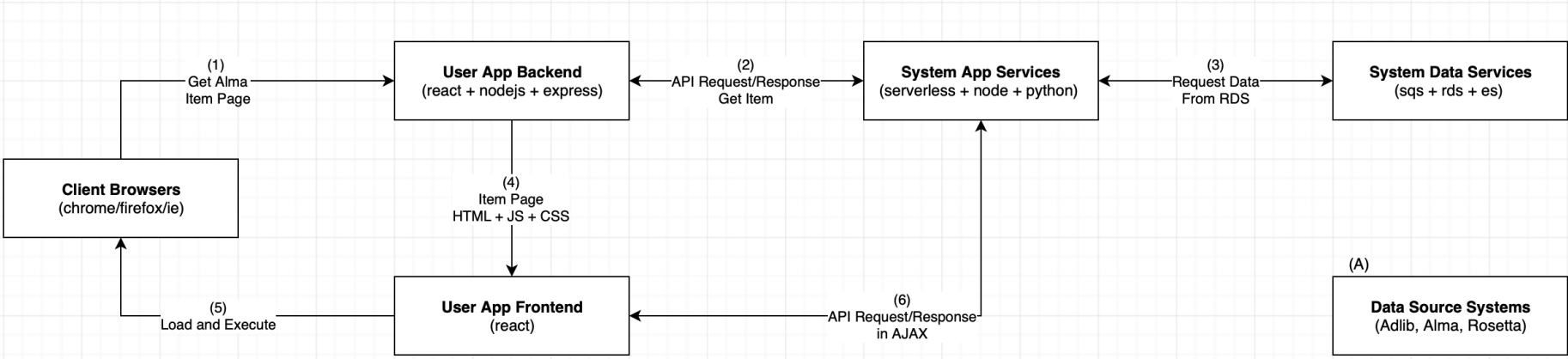Application

Monolithic applications

User interface

Web services
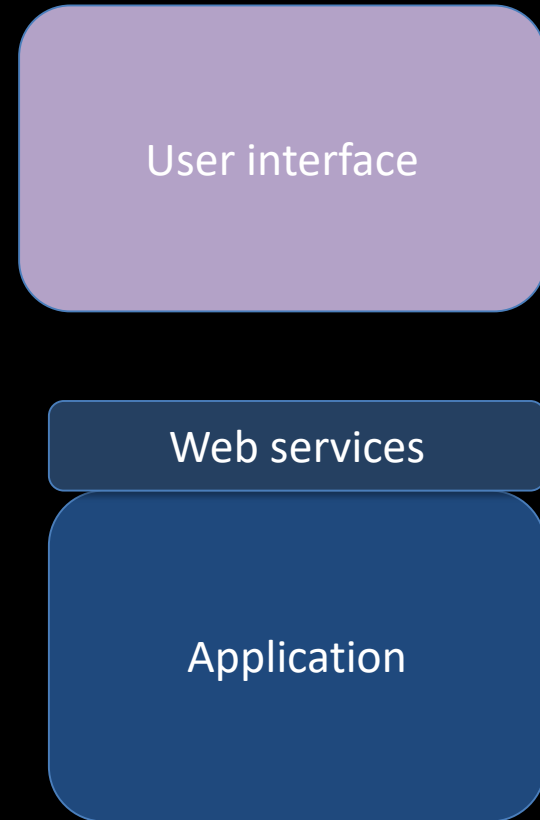
Application

Decoupled application

User Experience - headless architecture

User experience APIs – Get Record

Client Browsers
(chrome/firefox/ie)

User App Backend
(react + nodejs + express)

System App Services
(serverless + node + python)

System Data Services
(sqs + rds + es)

User App Frontend
(react)

Data Source Systems
(Adlib, Alma, Rosetta)

(1)
Get Alma
Item Page

(2)
API Request/Response
Get Item

(3)
Request Data
From RDS

(4)
Item Page
HTML + JS + CSS

(5)
Load and Execute

(6)
API Request/Response
in AJAX

(A)

User experience APIs – Data Ingestion
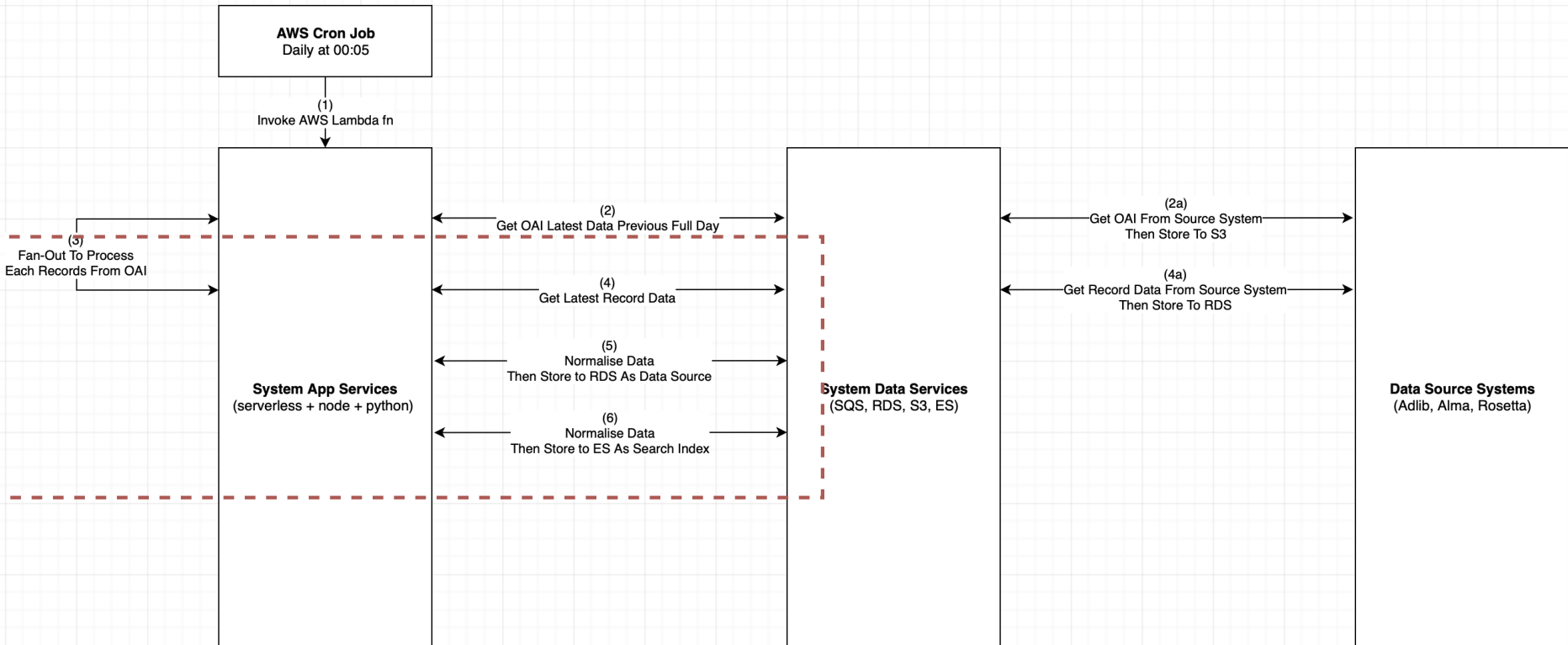
API Management - Apigee

- One of Apigee's top features is the Response Cache:

  - API responses are stored in Apigee "forever"

  - Subsequent responses are returned from Apigee, skipping "round trips" to back end systems

  - Responses are hundreds of times faster

  - Back end systems avoid traffic / load

  - Entries are refreshed when data is updated

Response Time

🟧 AVERAGE TIME WITH CACHE
4.53 ms

🟦 AVERAGE TIME
816.84 ms
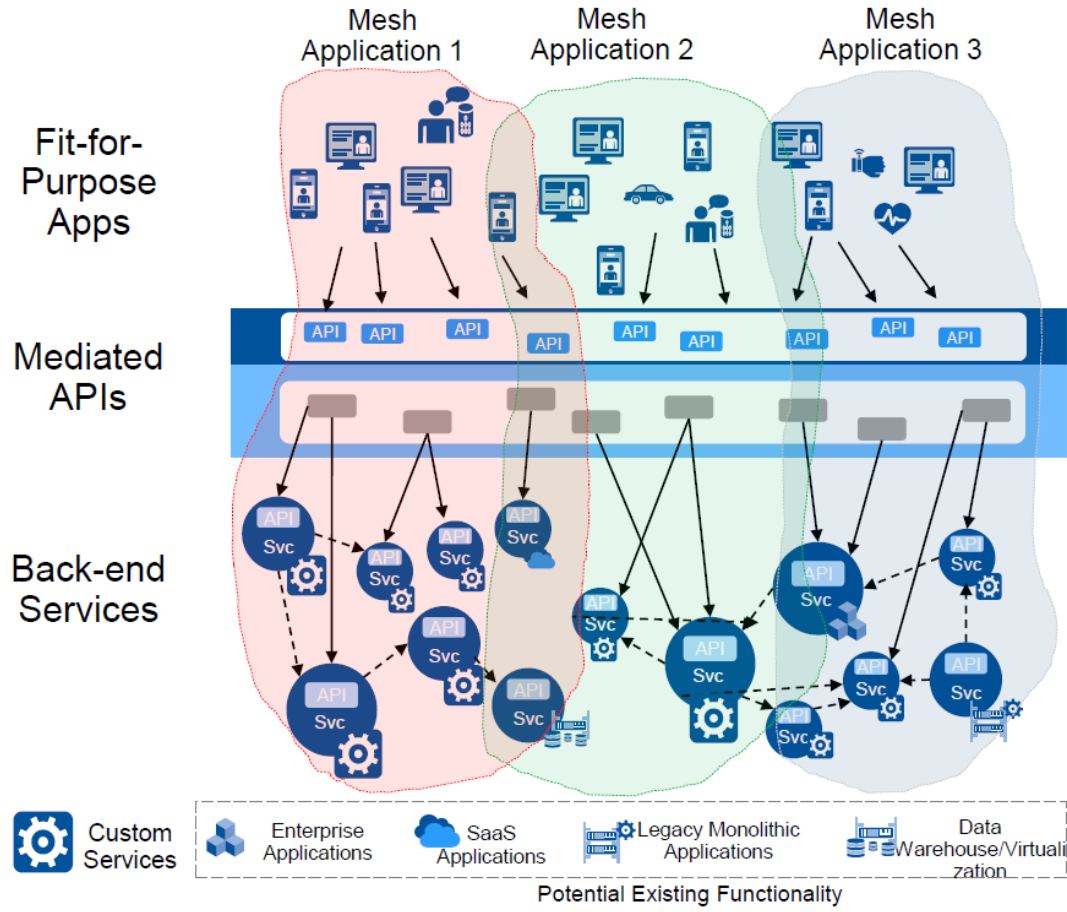
CACHE IMPROVEMENT
180.21 x Faster

Benefits of API mediation

- The architecture can be extended to other systems within the organization

- Services can be made available as required through the API, in the proper context

- API products can be created by grouping together API resources

- API consumers can be assigned access via API products

- Analytics can highlight API usage, and target areas of improvement

- The goals are to create a unified customer experience for the organisation, and make the library's data available
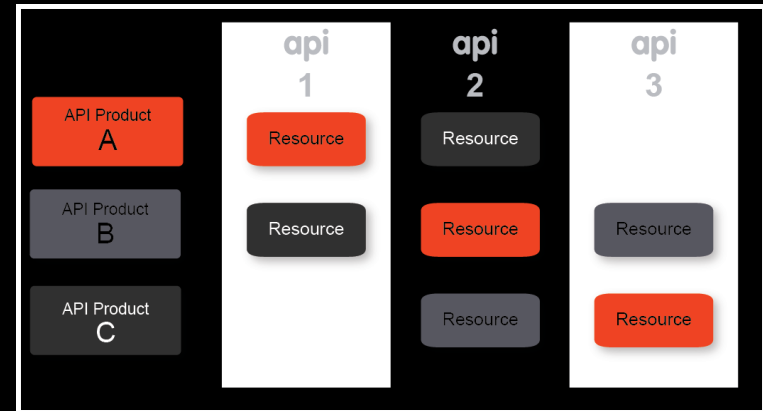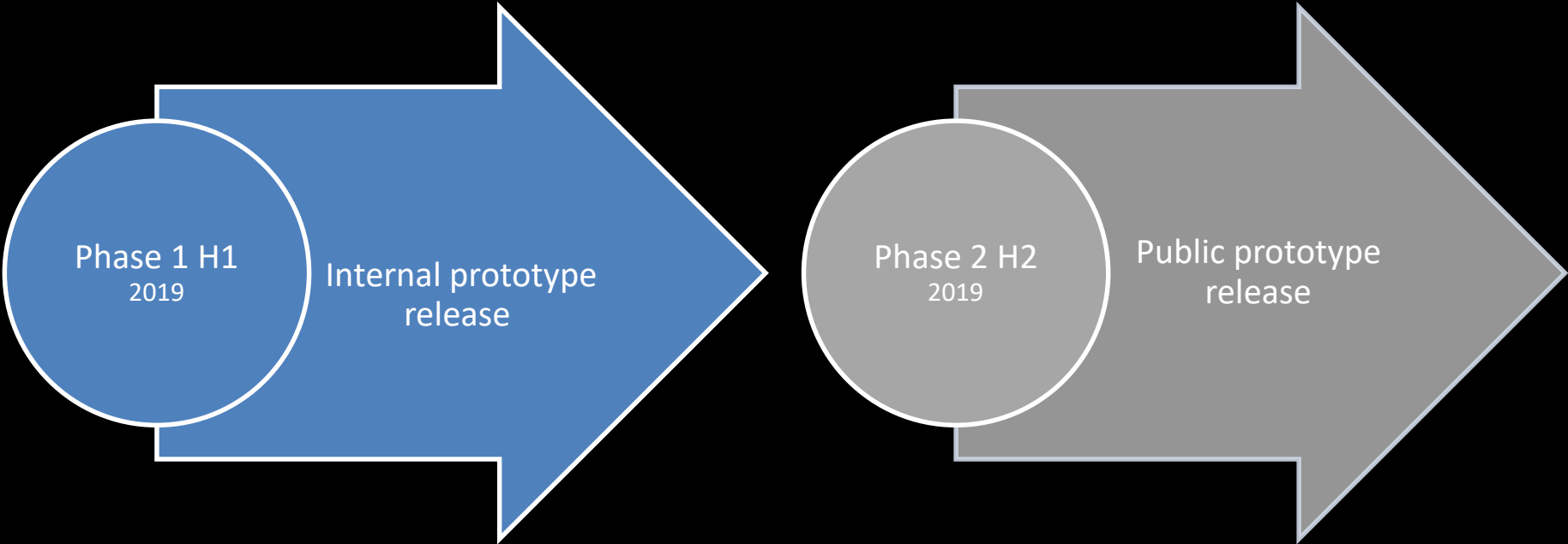
API Architecture - future

MASA: Mesh App and Service Architecture

Roadmap API and UI release – FY 19/20

Phase 1 H1
2019

Internal prototype release

Phase 2 H2
2019

Public prototype release

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Takeaways

- Implement an application strategy - use systems for their strengths; data & information

- Don't over customise/configure systems of record– creates technical debt

- Investigate service abstraction (micro/macro services) to improve system availability

- API mediation/management for interoperability, performance and automation

- Focus on alignment of technology with business strategy

Thank you

euwe.ermita@sl.nsw.gov.au