PAYLOAD™

Connecting the dots of a software ecosystem.

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About me

- CEO of Payload Technologies
- 20+ Years of Software Development Experience
    - O&G, Medical, Forestry, and Real Estate industries
- Started from Developer to Architect to Executive
- Passion for Software Development, Gaming and Muscle Cars (and Star Wars).

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Introduction

A Software Ecosystem is a collection of software projects, which are deployed, integrated and evolve in a connected software infrastructure.

- Application integration is the process of enabling independently designed applications to work together.
- Integrations are key consideration in how effectively an organization can use its applications, processes and data.
- Few, if any, software applications and data sources will live in isolation for a typical business.
    - Even if they are only connected via manual process today.
- According to a recent study, 99% of SMBs that use digital tools say these tools help them improve business performance and remain competitive.

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What does this mean?

Integrations are **key to a modern business's success**.

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Single vendor vs. best of breed.

- Meant to be an all-in-one, goal is to eliminate the need for integrations.
- A unified solution that houses all data and functionality into one place.
- Services and customization are part of the overall solution ecosystem.

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Single vendor vs. Best of breed.

- Independent solutions with depth of functionality in a specific area.
- Presents depth of functionality and deeper capabilities in their domain.
- Enterprise level solutions will be designed for integration at code and data levels.

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Realities of single vendor and best of breed solutions.

Single Vendor

- Ties you to a single platform, vendor and price increases.
- Always involves integration which often requires more specialized and expensive resources.
- Does not evolve as quickly in every area, tends to focus more on the platform than the solution.
- Customization can be required to get depth of solution for your business needs.

Best of Breed

- Rate of change can be a positive but also creates more effort to keep integrated, easily.
- Can be less customizable.
- Infrastructure requirements and integrations can be more complex and fragile.

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Key takeaway

"In either case, integration is inevitable as your software ecosystem evolves."

Three integration types.

1. Data

- Done through ETL, Data Dumps or Data Connectors.
- Cloud Data warehousing has simplified this through pre-built connectors and shared DMZ's.
- Enables data aggregates to form a Source of Truth useful in AI/ML and Data Analytics.

2. Process

- Can be automatic or manual integrations between different workflows in an organization.
- Consider opportunities for optimization through synergies and/or redundant aspects of two separate workflows.
- Process Maker, Azure Logic Apps or AWS Simple Workflow (SWF) many more options.
    - Evaluate each option to see if they are at the right level for your needs (high/low level).

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Three integration types cont.

3. Application

- If supported, can enable two applications to impact each other's state directly.
- Additional logic may be required to handle unavailable services (dead letter queue).
  - This also enables advanced options/alternate processing for these cases.
- Typically achieved at the WebAPI level through REST, GraphQL or SOAP.
  - REST has 70% adoption, easier, flexible and more performant than SOAP.
  - SOAP provides more security and better suited for distributed environments.

Process and application integrations.

Each of these integration types typically involve some aspect of the other.

- Data integrations rely on applications connecting to one another, even just a db connection can be considered an application integration (e.g., JDBC driver).
- Process integrations rely on applications and data to store workflow state and pass system commands.
- Application integrations need to send or receive data to for a typical use case.

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Data integrations - part one.

Most Process and Application integrations involve data exchange at some level.

Many different approaches to data integrations, each has its use but for system-to-system integration less is more, seek to avoid data at rest when unnecessary and reduce layers to keep things simple.

File drops

With in-app export functions (automated or scripted).

- Good for data extraction to allow users flexibility with spread sheets and manual imports.
- Bad for system-to-system integrations - less secure (data at rest), more infrastructure (SFTP).
- Recommend auditing for use of this approach to removing where possible.

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Data integrations - part one.

Most Process and Application integrations involve data exchange at some level.

Data Loads

Through custom scripts and SQL triggers.

- Highly fragile, create a complex integration environment and costly to maintain.
- Recommend replacing with ETL or Data Connector.

WebAPI's used for Data Extraction/Loading

- Can be used in Data Virtualization implementations (e.g., Denodo).
- API changes impact data structure, system availability considerations and costly to maintain.
- Recommend replacing with ETL or Data Connector if possible.

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Data integrations - part two.

Most Process and Application integrations involve data exchange at some level.

ETL/ELT or Extract Transform Load

- Many tools to streamline much of the complexity to move data.
- Consider costs involved, many ELT SaaS providers are charging "by the row”.
- Well known technique that has been improved over time to be relatively low cost.

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Data integrations - part two.

Most Process and Application integrations involve data exchange at some level.

Data Connectors

- Can be implemented over application or data level integrations, consider for your needs.
- Even if built over web services, should provide architectural abstraction for data ingestion.
    - For instance, data model changes can be captured with default or placeholder values.
- Many 3rd Party sources to assist with connecting to supported systems (Hubspot, Salesforce, etc.).

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Data integrations - part two.

Most Process and Application integrations involve data exchange at some level.

Shared Dataspace

- A DMZ between two different data ecosystems.
- Provider can create a view layer to enable. direct integration of BI tools and applications.
- Very simple to use for the consumer, often just a database connection.
- Often allows storage to be handled by provider for a "JIT" approach to queries.
    - e.g., You may not want to store millions of geo-coordinates but may need to build ML models from time to time.

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Data standards.

- As shown previously, there are many different mechanisms that can be used to integrate systems in your software ecosystem.

- With choices, comes complexity in two forms:
  - How do we enable these integrations on a Technology level?
  - How do we understand the impact of these integrations on a Business level?

- PIDX provides clear direction for both questions, which is key when integrations can happen in so many forms and across so many applications.

- When considering your options, understand that standards do not need to be rigid and constrain your own solution(s).
  - Sometimes we use standards to bridge the gap between systems only.

Final thought.

"Integrations should be viewed as an opportunity to synergize your existing and new investments. Integrations are a foundation to enable aggregate solutions of the future so your company can transcend a myopic and localized understanding of its potential."

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Questions?

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