Anthropic Finance Systems Architecture

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Abstract

This document outlines Anthropic Finance Systems' architecture[2] . It includes a high-level architecture diagram that visualizes the data pipelines from initial entry points—such as a new employee being hired in Greenhouse or an opportunity marked as closed-won in Salesforce—to NetSuite in the general ledgers, either as an expense report for Travel & Expense (T&E) or as a customer payment for Quote-to-Cash (Q2C), respectively. While the diagram encompasses the entire finance systems architecture, including HRIS and CRM that sources data to ERP, this document specifically details the Q2C process for brevity. Additionally, the document provides a quick glance into a roadmap planning and prioritization strategy, outlining how the architecture can be achieved through cross-functional alignment on requirements and visibility to timelines.

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[2] The Anthropic architecture diagram is based on assumptions derived from publicly available information. For example, banking providers identified correspond to reputable banks at Anthropic regional offices.

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1 Introduction

Similar to Anthropic's mission of developing AI that's grounded in safety, I posit the Anthropic Finance Systems architecture to be grounded in compliance. This design principle highlights a key distinction in financial engineering compared to other engineering fields: the capability to build something does not necessarily justify its creation. Instead, there is a critical need to construct finance automations and integrations that adhere to accounting standards and regulations. To this end, the Anthropic Finance Systems architecture is designed with two primary objectives: Main Data Management (MDM) and disparate systems data pipelines.

By achieving these two objectives, the Anthropic Finance Systems architecture will foster a data-informed culture, enhance quality of work through self-service capabilities and little to no manual or repeatable tasks, and a real world use case for Anthropic dogfooding[3]. This architecture is applied to processes such as Quote-to-Cash, Record-to-Report, Procure-to-Pay, and Hire-to-Retire.

1.1 Main Data Management

The first objective of the Finance Systems architecture is Main Data Management. Main Data is also known as "Master Data", "Golden Data", "System of Records", or "Data Marts". This ensures Anthropic's critical business data remain consistent, accurate, and reliable across the entire Finance Systems landscape through methods such as data replication, ETL (Extract, Transform, Load), and so on. In this architecture, I posit five Main Data: Employee, Customer, Vendor, Product, and Transaction. I posit these five Main Data because if described in plain English, we can say that an "Employee at Anthropic either sells or buys Product to Customer or from Vendor, respectively", with the act of selling and buying representing Transactions.

MDM is not a novel concept I am introducing—MDM originated as "master data management" in 1980 with four "master data"; Customer, Product, Location, and Other—but rather my adaptation of the original idea bespoke for Anthropic's operations and mission to make safe AI [1].

1.2 Disparate Systems Data Pipelines

As mentioned, methods such as data replication, ETL, reverse ETL, point-to-point integration, and reconciliation are how we manage the integrity of the five Main Data. These techniques serve the architecture's second objective: disparate systems data pipelines. Data pipelines is the "glue" that connects all the disparate systems in the stack and traverses data across the architecture end-to-end to eliminate manual and duplicated data processing. The pointers, as shown in Figure 1, represents and visualizes data pipelines from source systems such as Workday and Salesforce to destination systems such as NetSuite, AWS RDS data warehouse, or AWS S3 data lake.

[3] Extend Claude in Slack by integrating Anthropic's Slack workspace with the underlying Finance Systems architecture through Claude Tool Use to enable Anthropic employees to conversate with Claude to execute actions such as creating PTO requests in Workday, approve transactions in ZipHQ, or see upcoming travels from Navan. For example, imagine an AI system that recommends a user to delegate all their transaction approvals in ZipHQ, Navan, and NetSuite after detecting their upcoming PTO in Workday.

1.3 Anthropic Finance Systems Architecture Diagram

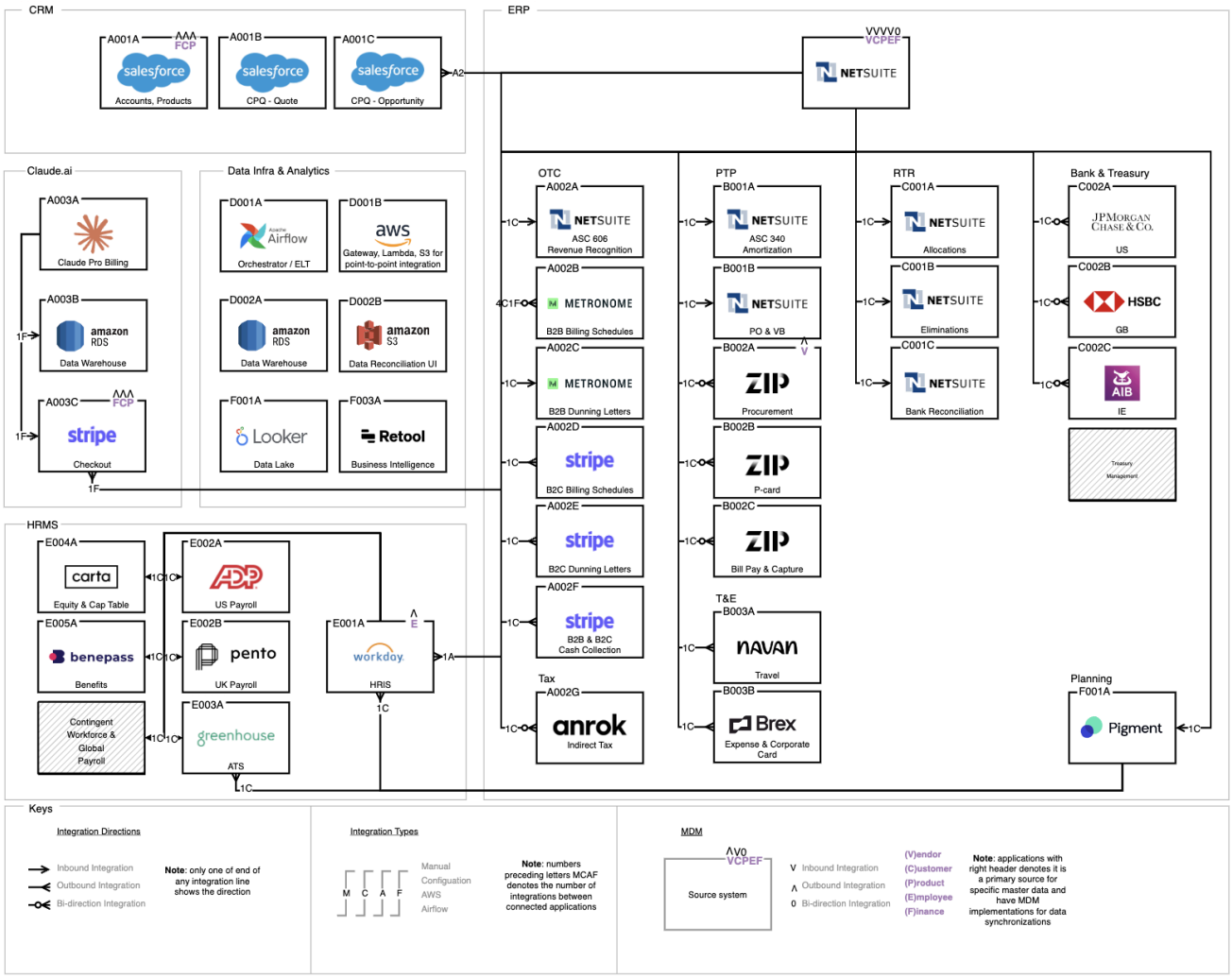


Figure 1 The Anthropic Finance Systems architecture diagram[4] visualizes how data traverses from source stack such as CRM and HRMS (inclusive of HRIS and HCM) to destination stack such as ERP and Data Infrastructure to store data in data warehouses and data lakes to enable large-scale data transformation and analytics. The pointers represents data pipelines from source systems—such as a new employee hired in Greenhouse or an opportunity marked as closed-won in Salesforce to destination systems like NetSuite in the general ledgers, either as a Journal Entry to record salaries for the new employee hired for Record-to-Report (R2R) or as a Customer Payment to record cash collection for Quote-to-Cash (Q2C), respectively.

[4] The Anthropic architecture diagram is based on assumptions derived from publicly available information. For example, the identification of Benepass as Anthropic's benefits system corresponds to the list of Benepass customers provided on its website.

General Journal of CPQ Subscription and Usage for Anthropic B2B segment

Date	Account	Reference	Debit	Credit
Jan 15	Accounts Receivable	Invoice #01	120,000	
15	Accounts Payable (Sales Tax)	Invoice #01	9,600	
15	Deferred Revenue	Invoice #01		110,400
15	Expense (Partner Commissions)	Journal Entry #01	3,600	
15	Accounts Receivable	Journal Entry #01		3,600
31	Deferred Revenue	Journal Entry #02	10,191	
31	Income	Journal Entry #02		10,191
Feb 4	Current Assets (Undeposited Funds)	Payment #01	116,400	
4	Accounts Receivable	Payment #01		116,400
15	Cash	Deposit #01	116,400	
15	Current Assets (Undeposited Funds)	Deposit #01		116,400

Figure 2 The general journal illustrates a 1-year B2B contract worth an annual total of $120,000, closed through AWS Marketplace as Invoice #01 and obligates Anthropic to pay a 3% commission to its partner and reseller, AWS. The commission is recorded as an expense in Journal Entry #01. Additionally, there is an 8% indirect tax liability totaling $9,600. Following the creation of the invoice, a corresponding Revenue Arrangement and its Revenue Plans are created. In the subsequent month to the invoice, these Revenue Plans lead to the generation of Journal Entry #02 to recognize revenue in accordance with ASC 606. Lastly, to complete the Q2C process, Payment #01 denotes the customer payment of the invoice through Stripe and Deposit #01 signifies the Stripe payout that occurs every 7 to 14 days.

General Journal of Claude Pro Subscription for Anthropic B2C segment

Date	Account	Reference	Debit	Credit
Jan 1	Accounts Receivable	Invoice #02	22	
1	Accounts Payable (Sales Tax)	Invoice #02	2	
1	Deferred Revenue	Invoice #02		20
1	Current Assets (Undeposited Funds)	Payment #02	22	
1	Accounts Receivable	Payment #02		22
15	Cash	Deposit #02	22	
15	Current Assets (Undeposited Funds)	Deposit #02		22
31	Deferred Revenue	Journal Entry #03	18	
31	Income	Journal Entry #03		18

Figure 3 The general journal records a $20 monthly subscription to Claude Pro for a B2C customer as Invoice #02 with an 8% tax that raises the monthly billing to $22. The Q2C process for B2C differs slightly from the B2B segment, particularly when recognizing revenue. In B2B, the Arrangement creates a Plan for multiple months. For B2C, however, the Plan consists of a single line to instruct NetSuite to generate Journal Entry #03 and recognize revenue for the January 1 to January 31 period. The cash collection process remains consistent across both segments, where Customer Payment #02 represents the paid Stripe charge and Deposit #02 indicates the Stripe payout that occurs every 7 to 14 days.

2 Architecture Breakdown and Build versus Buy

While the architecture diagram encompasses the Finance Systems landscape end-to-end, this section will focus on the Q2C process for brevity. Additionally, the section will examine the data engineering stack, offering insights into the design of data pipelines that sets the Anthropic's Q2C process for scale and high transaction volume analytics. Analyzing the data engineering stack is also essential, as it often presents a pivotal build versus buy decision point, determining the most effective approach building and maintaining data pipelines. To navigate this decision, I utilize a framework based on the following criteria:

- **Customization Spectrum**: This spectrum ranges from out-of-the-box solutions requiring no customization and only configuration to entirely in-house built tools. This spectrum guides us to achieve as close to native functionalities as possible, thereby leveraging additional benefits such as industry-enforced software upgrades (e.g., amended compliance and controls like NetSuite Advanced Revenue Management for ASC 606), support, and adherence to best practices.
- **Use case maturity**: Anthropic's dual business model serves as a prime example for assessing use case maturity, especially concerning ASC 606 within the Q2C process. For example, in Anthropic's B2C segment, I recommend integrating Stripe and NetSuite via the Stripe SuiteSync connector. This data pipeline pairs Stripe's subscription with NetSuite's invoicing for deferred revenue recognition, a feature tailored for the subscription pricing model that has undergone iterative refinement since 2015. For the B2B segment, I posit employing ETL or ELT data pipelines to replicate usage data from Anthropic Platform's data warehouse to Finance's data warehouse. This usage data is then transformed and refined for billing plans creation in Metronome and is further elaborated in §2.2.

2.1 Revenue Systems Stack (Quote-to-Cash)

The Revenue Systems stack is designed to accommodate Anthropic's dual business model. It is structured for two initial data entry points: B2C through Claude Pro and B2B through Salesforce CPQ.

- **Salesforce** as source of truth for Customers (i.e. Accounts) and CPQ (Product and Quote), enabling the Anthropic Sales and Partnership teams to create quotes and conduct sales to B2B customers, with pricing approved and signed (via DocuSign) before an Opportunity is marked as "Closed Won". Following this, Metronome extracts the pricing and quotes to create billing plans.
- **Metronome** serves as the source of truth for billing B2B customers. It allows Anthropic Billing Operations to generate invoice plans, invoices, and dunning letters automatically with pricing data extracted from Salesforce and usage data from Anthropic's data warehouses. It also calculates taxes through Anrok. Created invoices are then synchronized with Stripe for invoicing and charging. Stripe then syncs to NetSuite as an Invoice for general ledger entries, specifically to manage deferred revenue and Accounts Receivable (A/R) as shown in Figure 2 as Invoice #001.
- **NetSuite** serves as the source of truth for transactions recorded in the general ledger and for recognizing revenue. It facilitates the creation of Revenue Arrangements, Elements, and Plans to manage the deferred revenue for subscription and usage items while crediting revenue. Additionally, NetSuite synchronizes with Stripe to process payments linked to invoices, adjusting A/R and undeposited funds. These payments are compiled into deposits every 7 to 14 days to

reflect the payout from Stripe, thereby adjusting cash and undeposited funds. This general ledger flow across Q2C is visualized in Figure 2.

- **Stripe** is the source of truth for managing invoices and payments. For B2B collections, Metronome loads invoices into Stripe, enabling the generation of charges and payment synchronization to NetSuite as shown in Figure 2. For B2C collections, Claude Pro checkout processes charges into both the data warehouse and Stripe as shown in Figure 3. Stripe then synchronizes with NetSuite as payments for settled charges and deposits for Anthropic's payouts every 7 to 14 days to complete Q2C for both the B2B and B2C segments.

2.2 Data Engineering Stack

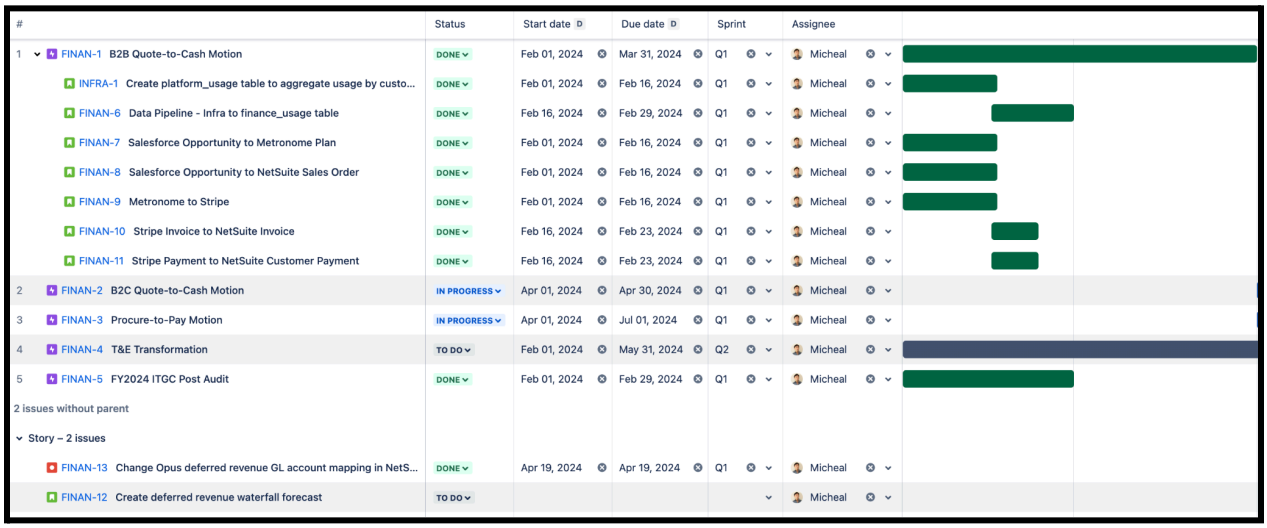
To facilitate the various data pipeline techniques such as ETL, point-to-point integration, or out-of-the-box connectors within each finance system, the data engineering stack should consider:

- **Airflow**: Open-source software to orchestrate large-scale ELT data pipelines across Anthropic's Finance Systems and AWS data warehouses using Python. However, Airflow does have two limitations. Firstly, its connectors are limited and cannot integrate with most finance systems, including Stripe and NetSuite. Secondly, it's limited to scheduled tasks.
- **PyAirbyte**: To address Airflow's first limitation: connectors, PyAirbyte is an open-source Python module that grants access to Airbyte's extensive catalog of connectors. Similar to Airflow, the application of these connectors is primarily for scheduled tasks.
- **AWS API Gateway, Lambda, S3**: To address Airflow's second limitation: scheduled tasks, AWS services such as API Gateway, Lambda, and S3 can be leveraged to build real-time and point-to-point data pipelines (e.g. CPQ opportunity marked as closed-won in Salesforce immediately syncs to create Sales Order in NetSuite). Like Airflow, however, AWS requires building in-house connectors for NetSuite, Stripe, and so on.
- **AWS RDS and S3**: Act as data warehouse and data lake to store data extracted from Salesforce, NetSuite, and so on to build data marts for analytics, business intelligence, and MDM.
- **Workato**: In a scenario where rapid development for real-time and point-to-point integrations is needed, then Workato becomes a viable option with its extensive catalog of connectors.
- **Specialized connectors**: For non-novel use cases, leveraging out-of-the-box offerings from ZipHQ or Stripe is advisable. However, for unique pricing and billing models such as Anthropic's token-based pricing, which the industry is not yet accustomed to and demands a robust data infrastructure to handle large-scale data, connectors like Stripe SuiteSync may not be suitable.

3 Roadmap Strategy

To achieve the future state the Anthropic Finance Systems architecture and achieve its two primary objectives of MDM and disparate systems data pipelines, I posit a roadmap strategy rooted in three project management methodologies: Software Development Life Cycle (SDLC), Planning and Prioritization, and Roadmap Alignment. In the initial phase of my 30/60/90 plan, I will begin the development of Anthropic's IT General Controls (ITGC) by implementing SDLC. Secondly, I will shadow Anthropic Finance contributors to understand current processes and capture requirements, gaps,

and areas for improvement. With the SDLC framework in place, tasks captured can then be systematically added to the backlog for Planning and Prioritization as shown in Figure 4 under “2 issues without parent”.



#		Status	Start date	Due date	Sprint	Assignee
1	FINAN-1 B2B Quote-to-Cash Motion	DONE	Feb 01, 2024	Mar 31, 2024	Q1	Micheal
	INFRA-1 Create platform_usage table to aggregate usage by custo...	DONE	Feb 01, 2024	Feb 16, 2024	Q1	Micheal
	FINAN-6 Data Pipeline - Infra to finance_usage table	DONE	Feb 16, 2024	Feb 29, 2024	Q1	Micheal
	FINAN-7 Salesforce Opportunity to Metronome Plan	DONE	Feb 01, 2024	Feb 16, 2024	Q1	Micheal
	FINAN-8 Salesforce Opportunity to NetSuite Sales Order	DONE	Feb 01, 2024	Feb 16, 2024	Q1	Micheal
	FINAN-9 Metronome to Stripe	DONE	Feb 01, 2024	Feb 16, 2024	Q1	Micheal
	FINAN-10 Stripe Invoice to NetSuite Invoice	DONE	Feb 16, 2024	Feb 23, 2024	Q1	Micheal
	FINAN-11 Stripe Payment to NetSuite Customer Payment	DONE	Feb 16, 2024	Feb 23, 2024	Q1	Micheal
2	FINAN-2 B2C Quote-to-Cash Motion	IN PROGRESS	Apr 01, 2024	Apr 30, 2024	Q1	Micheal
3	FINAN-3 Procure-to-Pay Motion	IN PROGRESS	Apr 01, 2024	Jul 01, 2024	Q1	Micheal
4	FINAN-4 T&E Transformation	TO DO	Feb 01, 2024	May 31, 2024	Q2	Micheal
5	FINAN-5 FY2024 ITGC Post Audit	DONE	Feb 01, 2024	Feb 29, 2024	Q1	Micheal
2 issues without parent						
Story – 2 issues						
	FINAN-13 Change Opus deferred revenue GL account mapping in NetS...	DONE	Apr 19, 2024	Apr 19, 2024	Q1	Micheal
	FINAN-12 Create deferred revenue waterfall forecast	TO DO				Micheal

Figure 4 Above is the Anthropic Finance Systems Roadmap for Q1. FINAN-1 to FINAN-5 are projects planned and prioritized with the cross-functional teams while the “2 issues without parent” section below is the backlog of ad-hoc requirements. The advantage to having the roadmap organized in this manner is if the Finance Systems team expands, the roadmap can be accelerated through parallel development. For example, Engineer #1 can focus on FINAN-1, 2, 3, and 5 while the new hired Engineer #2 could simultaneously tackle the not yet started FINAN-4.

3.1 Planning and Prioritization

With the backlog compiled, my next step involves categorizing and grouping related tasks. This step ensures our implementations address all tasks for efficient development as shown in Figure 4 under FINAN-1. For instance, if two distinct requirements were identified—one for replicating CPQ Products into NetSuite and another for creating Deferred Revenue accounts for subscription and usage items—these will be merged into the same project. Following the organization of all requirements, I’d establish regular meetings with the leads of each functional area (e.g., Controller, RevOps Manager, BillingOps Manager). These discussions are designed to prioritize the most pressing requirements for each quarter and provide visibility to roadmap progression.

3.2 Roadmap Alignment

In the regular meetings with my cross-functional team and leads of each functional area, my focus will always be to ensure our roadmap aligns with Anthropic’s evolving needs and priorities. For example, should we encounter a critical bug in our deployed solution necessitating an immediate hotfix, we may need to adjust our roadmap priorities accordingly, potentially postponing other planned initiatives as shown in Figure 4 where FINAN-13 was unscoped for the roadmap but completed prior to scoped projects. This alignment approach allows the Finance Systems team to be flexible and adaptable to fast-changing operational strategy and requirements.

4 References

[1] K. Foote, “A Brief History of Master Data.” 2019. https://www.dataversity.net/a-brief-history-of-master-data/