



LEVERAGING BUSINESS ARCHITECTURE TO TRANSFORM CRITICAL DATA MODELS

Business Architecture: A Real-World Case Study

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Autodesk Overview

With technology that spans architecture, engineering, construction, manufacturing, media, education, and entertainment industries, Autodesk empowers innovators to achieve the new possible and make a better world for all.

Founded in 1982, rather than waiting for progress, Autodesk believes in making it. By combining technologies, unleashing talent, and unlocking insights, Autodesk's industry solutions and platform services help innovators and creators solve today's most challenging problems and transform what actually needs making.

To enable business transformation and deliver innovative technology, Autodesk uses business architecture to align their strategy, capabilities, and products with the needs and expectations of Autodesk's customers and future endeavors. Guided by a shared blueprint and common language, business architecture is the foundation for strategy execution and how Autodesk achieves their priorities to deliver a world-class customer experience, catalyze their customers' digital transformation, and establish an industry-leading platform for designers and makers.

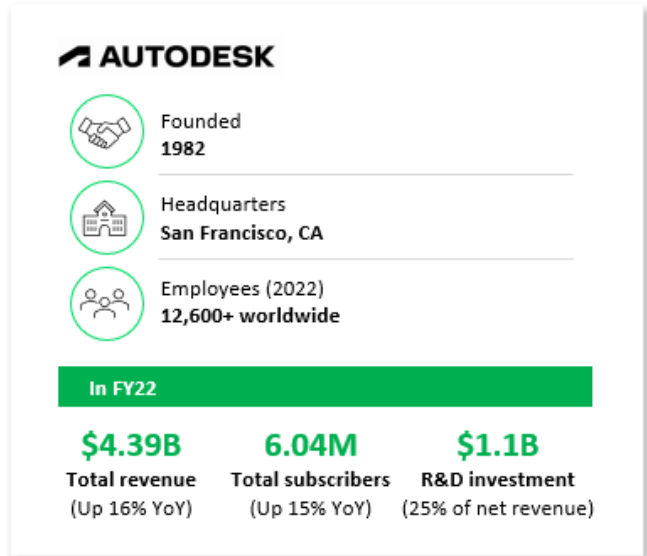


Figure 1: Fiscal year 2022, Feb 2021– Jan 2022

Business Model Evolution

Like most of the software industry, Autodesk's business model, captured in figure 2¹, has evolved from developing and selling perpetual licenses and on-premises products to subscriptions, cloud-based technologies, and personalized services.

Initially created to put shrink-wrapped boxes onto shelves, Autodesk's system lacked the

backend infrastructure needed to transition their business model to a subscription model. To support both strategic and business model shifts, they launched several infrastructure projects guided by three key components that required transformation: customers, offerings, and agreements.

While their customer data model was well established, when it came to their offerings, the company's data structure system required a hands-on approach and was not fit for the next level of transformation. To resolve this issue, the business architecture team needed to evaluate their data and how data structures could support

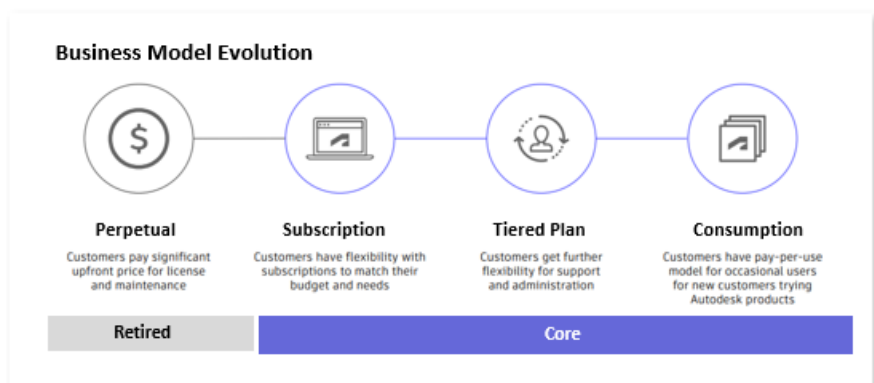


Figure 2: Multiple fronts of transformation

the new business going forward. An immediate challenge was translating business capabilities and language to the technical architecture. They found a middle ground using a conceptual data model, seen in figure 3, to express business data language and objects, relationships, and how they would support future functionalities.

By combining business architecture and data architecture, the team aligned technical capabilities with business terminology which informed the physical system architecture and enabled strategic business discussions, illustrated in figure 4. Although the data architecture and business architecture teams worked well together initially on the operating model, once a draft model was established, they considered it a technical exercise and released business architecture from the project. The data architecture team then did not have a business partner and used technical tools and diagrams to express business relationships which resulted in a technical exercise and lost time and focus.

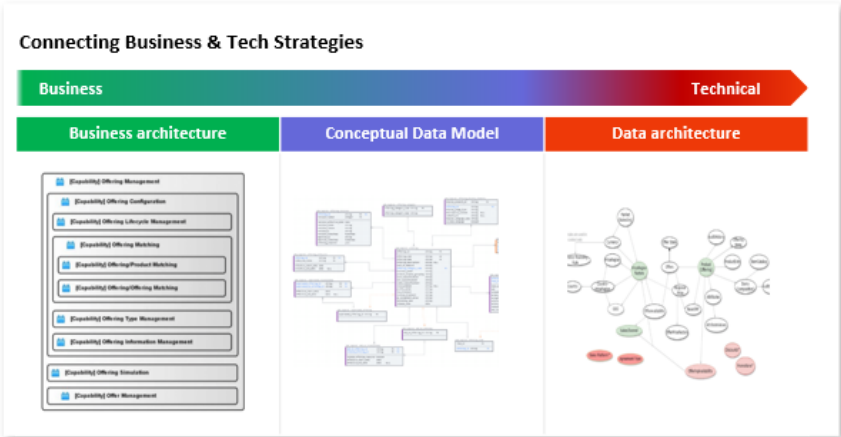


Figure 3: Making business architecture real across business & tech strategies

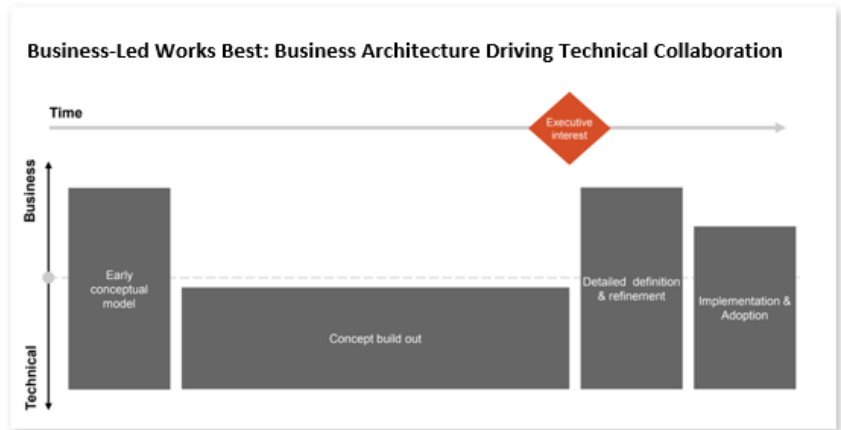


Figure 4: Business-led business architecture enables acceptance & collaboration

Business Data Model Development

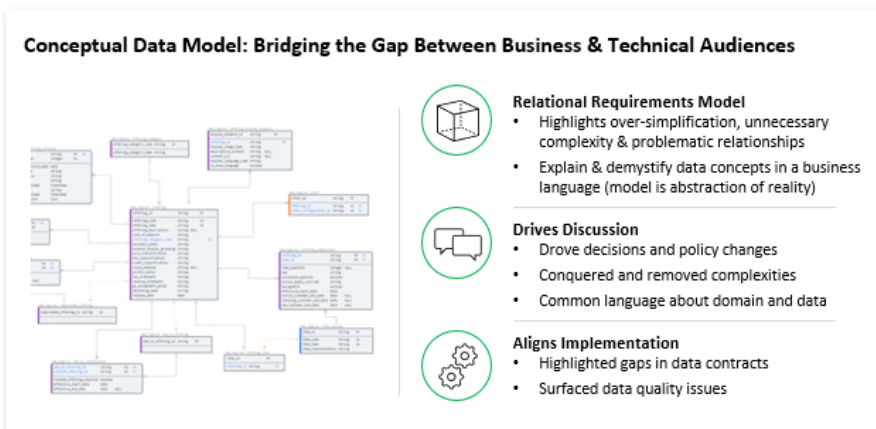


Figure 5: Aligning business and technical teams

To course correct, the business architecture team was reengaged as a business partner and owner and together they revisited their conceptual data model, captured in figure 5, to evolve how they explained and demystified data with a business-led approach. They continued to educate the organization and facilitated strategic discussions that bridged the gap between business and technical

audiences and positioned business architecture as key to the future and earned executive attention. The actual output began with the team’s early strawman, a journey captured in figure 6. With their initial model and few stakeholders, the team evaluated industry standards and business architecture maps to assess problem areas, process impacts, and capabilities that impacted domains.

Next, they initiated scenario testing, with inputs that included value streams, journeys, and use cases to refine the model, identify policy changes, and expose data contract gaps. An iterative process that expanded across multiple stakeholders, the team leveraged feedback from both contrarians and early adopters, challenged assumptions, clarified definitions, and ultimately finalized their model.

As they prepared for rollout, the team was empowered with strengthened engagement across the organization, equipped to answer questions with confidence, and ultimately came to an implementation agreement. Rather than a mandate, by presenting their framework as a strategic blueprint, the team gained buy-in from those resistant to change and evolved the way the business defined and referenced their offerings.

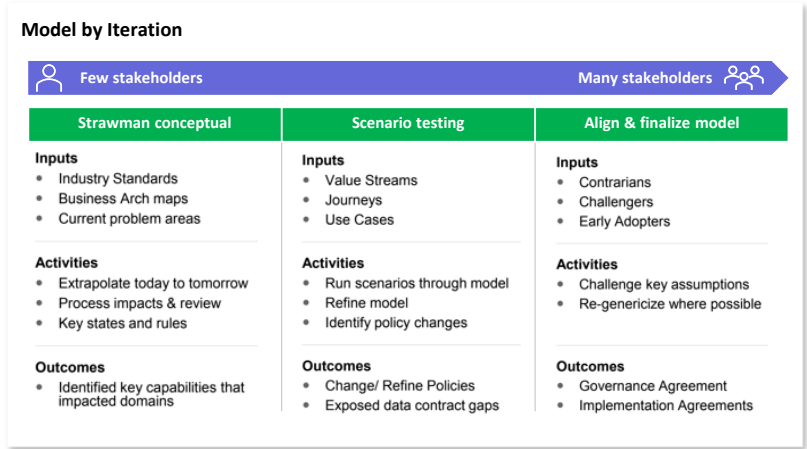


Figure 6: An iterative approach to business modeling

Deliverables

To inform deliverables, the team evaluated their offerings, which were complex data models that described Autodesk’s products. Each product was a composition of that offering – and could be sold in multiple ways.

Configurable bundles with many attributes customers could choose from at the time of purchase, the team broke them down into manageable “bite-sized” pieces and detailed them in their logical ERD, seen in figure 7, a diagram that included details of entities, their attributes, and the relationships among them.

Leveraging these artifacts, the team applied a different lens to create unique views, such as offer perspectives and boundaries, offer compositions, and Autodesk’s software catalog. Color-coded, these

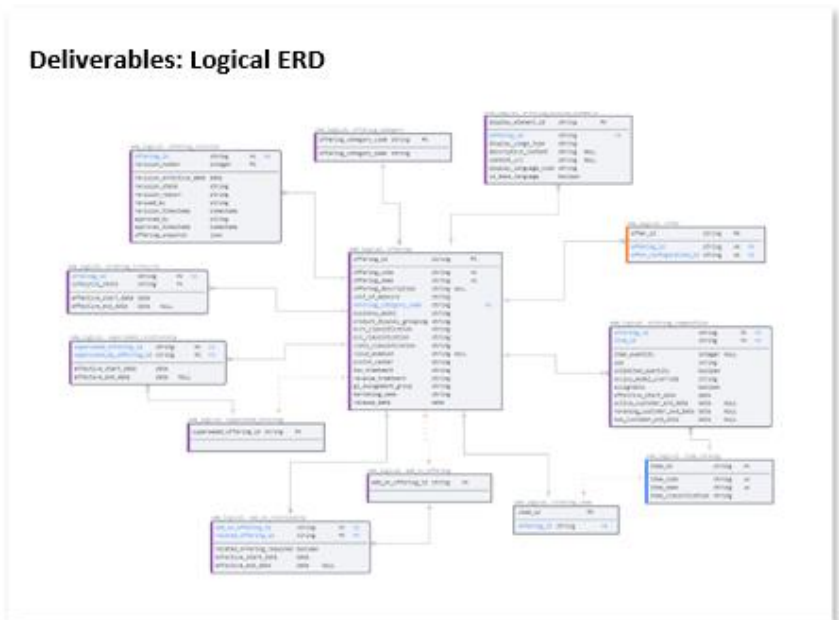


Figure 7: Attributes and relationships that describe data requirements

diagrams enabled the team with information maps, supported lifecycle management, and helped the team align with technical stakeholders.

Deliverables: Related Data Dictionary

Offering		An offering is a container for those items that an Autodesk customer has access to after purchasing an offer.			
Attribute Name	Attribute Description	Attribute Class	Business Rules	Attribute Values	Implemented
Identifying attributes (internal reference)					
Offering ID	Uniquely identifies the Offering Master; system generated, non-meaningful ID	RefID	Generate a unique reference ID	N/A	Apollo R1
Offering code	Recognizable unique short code or label used internally for unique identification, reference, and reporting; may change over time	Code	Request a unique code [P03] - must be a unique value against current and past offerings; track changes over time		Apollo R1
Offering name	Descriptive name of the Offering used internally for unique identification, reference, and reporting; usually the same as the brand name without trademark & special symbols	Name	Must be unique across all offerings; track changes over time	Example values: "3ds Max", "BIM 360", "Fusion Lifecycle", "3ds Team", "Autodesk 360 Mobile", ...	Apollo R1
Offering description	Description of the Offering Master used internally for reference	Name			Apollo R2.0
UoM	Unit of measure applying to all related offers as default for order line item UoM	LOV	All offers inherit the UoM from the offering. It is the default UoM on the order line when an offer is added to an order.	Each, Hours, Seats, Tokens, Users	Apollo R1
Business model	Sets the parameters by which a customer will be granted access to product(s), service(s) and/or support. Also sets the parameters for whether the offering is recurring, renewable or neither	LOV	Default = Subscription, all offers related to this offering must have a configuration with the same business model	Consumption, Maintenance, Perpetual, Services, Subscription	Apollo R1
Offering Descriptive Element		In per offering			
Display element ID	Uniquely identifies the Display Element; system generated, non-meaningful ID	String		May refer to a CHS Identifier in the future	TBD

Figure 8: Data dictionary used to solidify definitions and a common language

The team applied definitions to every attribute in the information map, each with unique constraints and set of values. To solidify definitions, they created a data dictionary, shown in figure 8, to make it easier to use, analyze, and discuss data across teams. With a centralized destination and agreement for defining data, the team was equipped to discuss change requests, evaluate new use cases, discuss where they fit in and if a new definition was required.

Governance

As early adopters building out transformations for other value stream components emerged, governance became a priority, as demonstrated in figure 9.

Rather than IT, operations, or the product team, business architecture became the natural place for governance and framework to manage and oversee model development, validation, usage, and tracking. A neutral function with decision-making authorities on the team to approve changes to the model, they were empowered at the executive level to manage the model going forward.

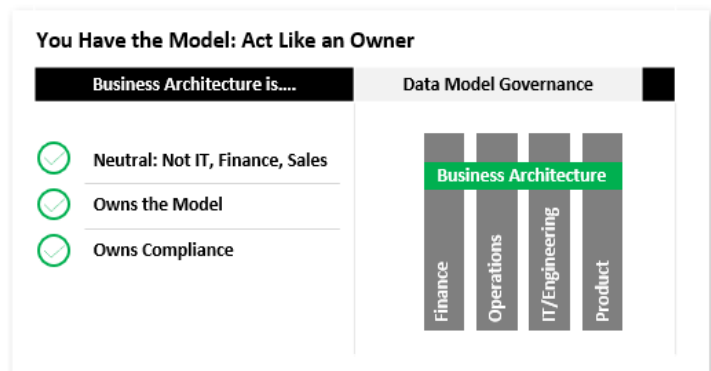


Figure 9: Data model governance

Illustrated in figure 10, for the business architecture team, success was earned by selling the “business imperative” along with continued education and evangelism. Using the model, it was natural to engage with the architects and product managers, which ultimately eliminated the need for other

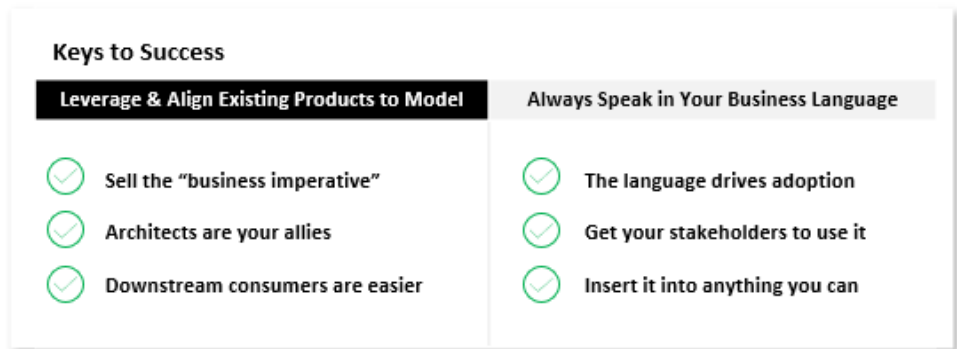


Figure 10: Gaining organizational buy-in and alignment

teams to create their own data models. With a common language and shared blueprint used by technical and business stakeholders, the result was alignment and the ability to accelerate speed to market without cross-functional discrepancies.

Autodesk doesn’t believe in waiting for progress; they believe in making it. As digital transformation, data, and analytics continue to evolve how industries operate, some changes are invisible to the eye: the transformation of business models. With a purposeful and holistic approach to innovation, Autodesk continues to evolve their business model to execute their strategic vision, create, deliver, and capture new growth opportunities, reduce costs, improve efficiencies, and stay ahead of customer needs.

With millions of people that trust their technology to advance how their products are made, the benefits of business architecture power transformation across solutions that span countless industries, deliver consistent revenue growth, and maximize shareholder value. Looking forward, Autodesk will continue to transform, innovate, and improve solutions that meet the changing needs of their customers and empower them to achieve their goals faster, smarter, and more sustainably.

“True and sustainable innovation does not come from technology alone; it comes from the flexibility to enable new business models. For Autodesk, business architecture cultivates a culture of innovation with data models that facilitate collaboration, unlock new sources of value, and help our customers create more sustainable and resilient solutions.”

Steven Scott, Director of Business Architecture, Autodesk Inc.

ⁱ [Business Architecture Innovation Summit](#)