

Building a Modern Architecture at a Wearable Medical Device Company

Background and Business Problem

SVDS was engaged by a medical device company that provides a chronic disease monitoring solution. The client's Internet of Things (IoT) platform includes a receiver with disposable sensors and transmitters, and offers web and mobile solutions for patients, caregivers, and clinicians to share, view, and assess device-generated data.

The company's leadership needed to change their focus from device to data. This became obvious as they grew their user base, evolved their commercial offering, added more engagement channels, and developed new partnerships in the market. These events exploded the volume and variety of transactional, customer, and device data.

Initially defined by each business function, architectural silos were not prepared for interoperability or cross-functional analysis. Further, given the narrow focus of the function-specific designs, there was no plan in place for larger storage needs. The company asked SVDS to design a new architecture to integrate, analyze, and expose the expanding data from the following areas:

- manufacturing, support, and sales teams
- patient-generated data from IoT devices and mobile applications
- third-party and partner data via direct feeds, batch uploads, and APIs

This new architecture needed to enable our client to create new data products and services, while not negatively impacting operations or the customer experience. The client also needed clear paths from where they currently were, to the desired architecture.

A leading medical device company wanted to shift its emphasis from devices to data, and needed a more interoperable architecture.

Silicon Valley Data Science designed and developed a unified architectural vision for the client's data platform, creating the capability for further growth.

The Challenge

Separate customer data repositories meant lots of trouble assembling the customer story

Needed to identify and collect new data sources

Existing architecture prohibited population insights in specific patient groups

Couldn't do value-based contracting



Solution

We started with a set of use cases representative of the types of future capabilities the client wanted. These included manufacturing, quality, sales, distribution, and streaming device log files. For each use case we identified:

- key business drivers
- current technical capabilities that delivered similar functionality
- unmet needs requiring new capabilities
- considerations for a future architecture to support the business
- engineering requirements for next-generation IoT devices

From these observations, we defined an architecture for the client that could:

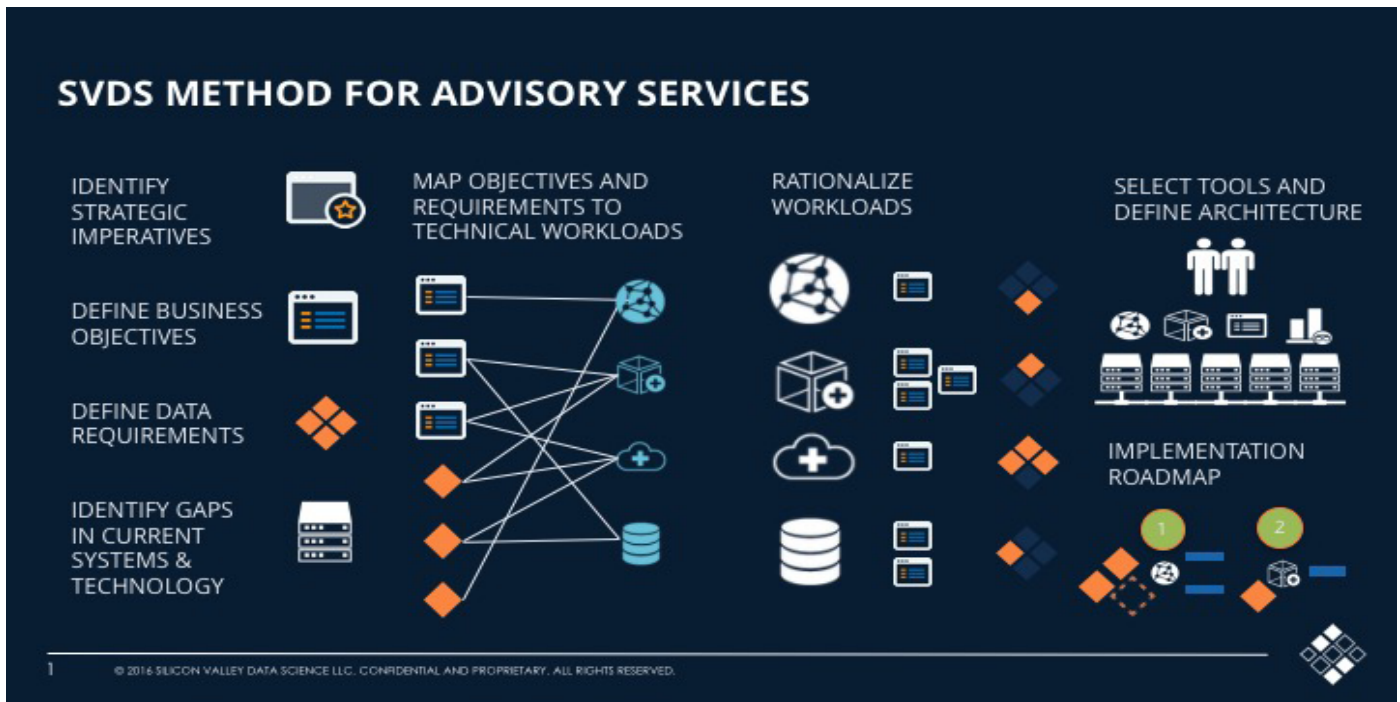
- ingest manufacturing, commercial sales, distribution, customer service, and consumer mobile platform data, allowing analysis across the business domains
- enable exploratory data science and creation of new data products for patient, partner, and company benefit
- securely expose services and continuous stream of data to third parties in the ecosystem

Our Approach

We mapped desired outcomes to enabling workloads and potential technologies

We crafted an architecture based on workloads, technologies, and client's existing IT systems

We created a roadmap focused on creating value early and iteratively enabling the data organization's skills to grow



We designed the architecture components based on guiding-principle characteristics such as cloud-based, distributed, open source, polyglot, and the ability to satisfy prioritized technical workloads for the use cases.

Beyond the architecture itself, we developed a phased roadmap that could:

- adapt to shifting market dynamics and evolving technologies
- force decision points when implementing specific capabilities

During the technical development phases, we made sure to address business objectives and enable product development choices, thus ensuring that the target architecture served the client's business needs. Prioritized platform investment recommendations laid out how to rapidly build a new distributed data platform using Hadoop.

New Capabilities

A unified architectural vision for the the client's data platform

A launchpad for exploratory analytics to experiment and create new data products

A prioritized plan for an external-facing API

