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OILFIELD SERVICES SEMINAR

Artificial Intelligence – Who is Using It (and Who Should Be)?

November 16, 2017

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1. Chiron Overview

CHIRON
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Chiron is a an investment bank based in the heart of the energy industry in downtown Houston, Texas. Chiron has an extraordinary depth of experience in oil and gas, oil field service and equipment, midstream and downstream energy. The Chiron management team has experience in the investment banking industry as well as operationally as executives from energy and energy related companies. This breadth of experience helps Chiron provide an unrivaled quality of service for our clients.

Artificial Intelligence

"In computer science, AI research is defined as the study of intelligent agents: any device that perceives its environment and takes actions that maximize its chance of success at some goal. Colloquially, the term Artificial Intelligence is applied when a machine mimics cognitive functions that humans associate with other human minds, such as learning and problem solving."

- According to Schlumberger Oilfield Glossary:

The study of ideas that enable computers to do the things that make people seem intelligent. Many computer programs written for use in the oil field utilize rule based approaches to provide expert systems. The rules are taken from an expert working in the field and are written in a way that attempts **to reproduce the knowledge and approaches used by that expert to solve a range of real problems**.
Most such programs are limited to specific areas such as dipmeter interpretation, electrofacies determination, reservoir characterization, blowout prevention, drilling fluid selection, etc. Sometimes expert systems are written in computer languages that easily handle "rules" such as LISP, but once fully tested are usually translated to BASIC, C or FORTRAN to be compiled into efficient applications or programs.

Internet of Things

The Internet of Things (IoT) is the network of physical devices, vehicles, home appliances, and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to connect and exchange data.

"We're looking for someone with your exact qualifications, but a mechanical version."

- Low commodity prices & lack of cash generation by E&P will keep pressure on pricing
- Aging labor pool, loss of knowledge
- Geographically dispersed work forces
- Decentralized decision making
- Fear of failure vs Trying New Approach
- Extremely limited venture capital and/or R&D money for the space
- Data quality management
- Data security

- Drive increased efficiency, lowering cost
- Capture current knowledge base
- Speed up centralized decision making
- Give geographic dispersed team decision making tools
- Enhance collaboration between different silos
- And…the digital natives are invading the space… Millennials

- **CVX** – Analyzing historical well performance to select better drilling location and completions process in the future
- **GE/BP** – All BP 6,000 wells being gathered on one platform for data analytics
- **Ambyint** – Combining traditional physics-based methods with artificial intelligence to provide artificial lift and production optimization solutions.
- **Schlumberger** – Integrating several products (DELFI, Lift IQ…)
- **Statoil** – Treasury functions

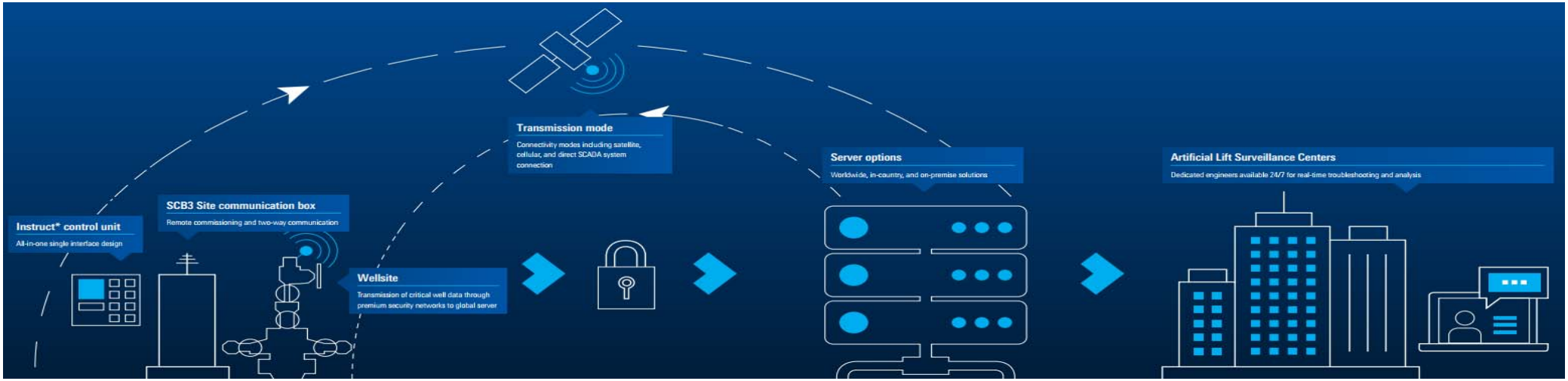

KDNUGGETS.com
"The robots have taken over almost all jobs,
but we still need Jenkins to cheat on our taxes"

Lift IQ Production Life Cycle Management Service

- **Monitoring and surveillance platform for artificial lift systems**
- Introduced by Schlumberger in March 2017
- Monitors and analyzes hundreds of data signatures
  - Identifies gas locking, production declines, solids production and other issues that impair pump performance
- Engineers in the artificial lift surveillance centers (ALSC) review alarms and issue recommendations (text message, email, phone)
- Immediately adjusts parameters to avoid shutdowns and return pumps to normal operating conditions
- 6 ALSC strategically located: Middle East, North America, South America, Europe, Russia and Asia
- Implemented in over 30 countries (200+ companies) worldwide

Lift IQ - Data Management

- Data gathered at the well-site
- Data transmitted via satellite or cellular connections and stored onsite, in-country or globally



- Data transmitted and analyzed in one Schlumberger's

Lift IQ - Case Study

- **Mississippi Lime Formation**
  - Unconventional liquid-rich formation
  - Rapid production declines
  - Solids production from sand used in hydraulic fracturing
  - High gas-to-liquid ratio

The operator needed to maintain ESP uptime to increase production while keeping lifting costs low in four wells

- Real-time monitoring of intake pressure and temperature, motor temperature, vibration, current leakage and pump discharge pressure
- Analysis conducted in the Houston center
- **Average run life for ESPs increased by 181%, while GLR increased 243% and production declined 94%**

- Well pumper routes planned after wellsite visits are ranked based on telemetry data
- Real time scheduling/routing of saltwater disposal trucks
- Real time regulation of flow back rates during plug drill outs to maximize completions
- Internet of Things
- Predictive maintenance
- Fleet Management

McKinsey estimated $50 billion in savings in Oil and Gas Supply chain

Internet of Things becomes smarter the more it is used: "Things like the cloud, machine learning and artificial intelligence are certainly exciting, but it's only when you can bring them together and connect them to domain knowhow that they can have a big impact." - *Gavin Rennick, President of Schlumberger's SIS*

SPRINGTIME VENTURES

CULTIVATING SEED STAGE INVESTMENTS IN THE ROCKY MOUNTAIN REGION

Matt Blomstedt | Managing Partner | mattb@springtimeventures.com | 303.900.3353

We love **startups**. We love the grit, passion, & innovation that entrepreneurs bring to the world.

We believe the **Rocky Mountain** region is ripe with opportunities to invest in disruptive technologies, but most opportunities are starved for good resources.

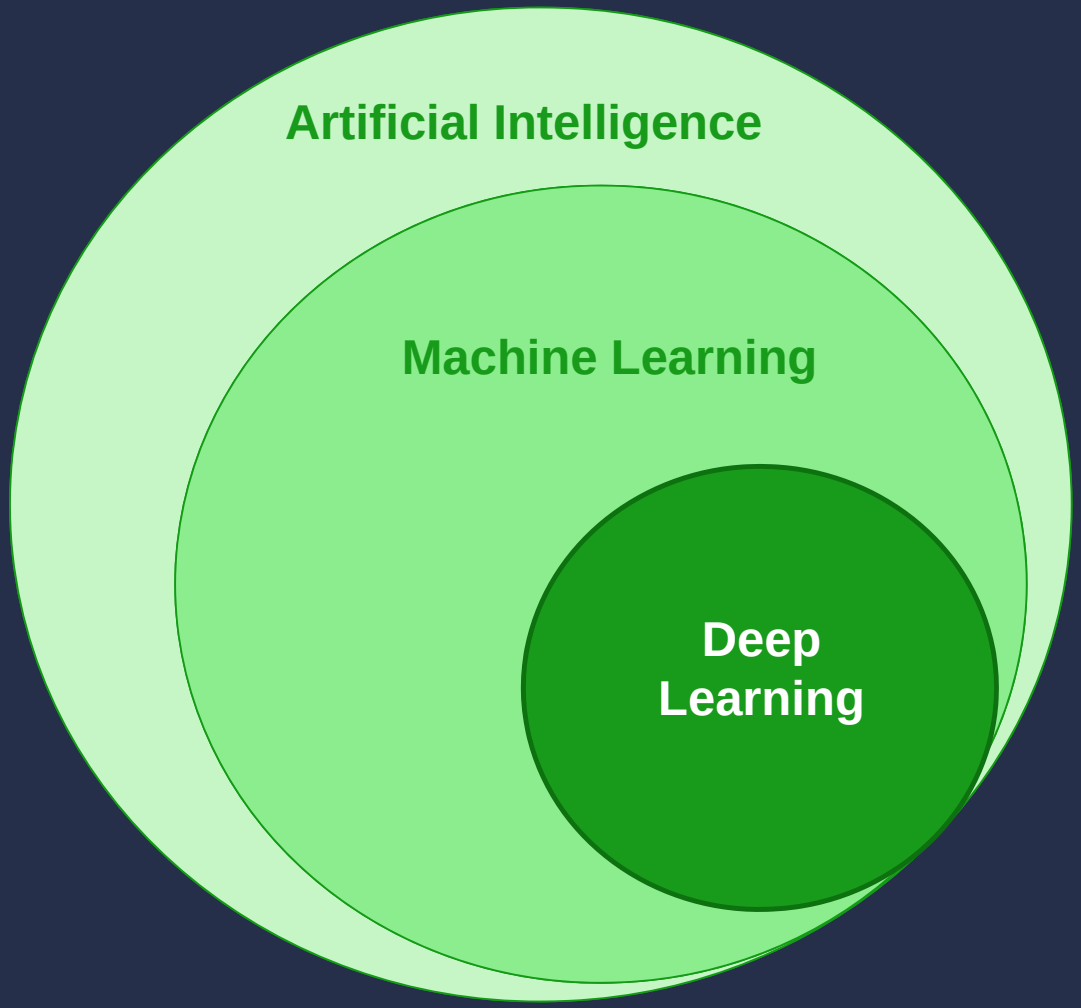
We believe in a company **culture** that inspires action, accountability, and intention. We have a deep soul for this, and we want our companies to be the same. We know ideas are not enough. We invest in trustworthy leaders who have deep domain experience. We want them acutely aware of the people, partners, and resources they need to grow.

We believe **our mission** is to nurture our deep relationships in the community to maximize the best deal flow, and leverage our reputation and process to generate excellent investment choices. We believe in executing our strategy with simplicity, curiosity, and respect.

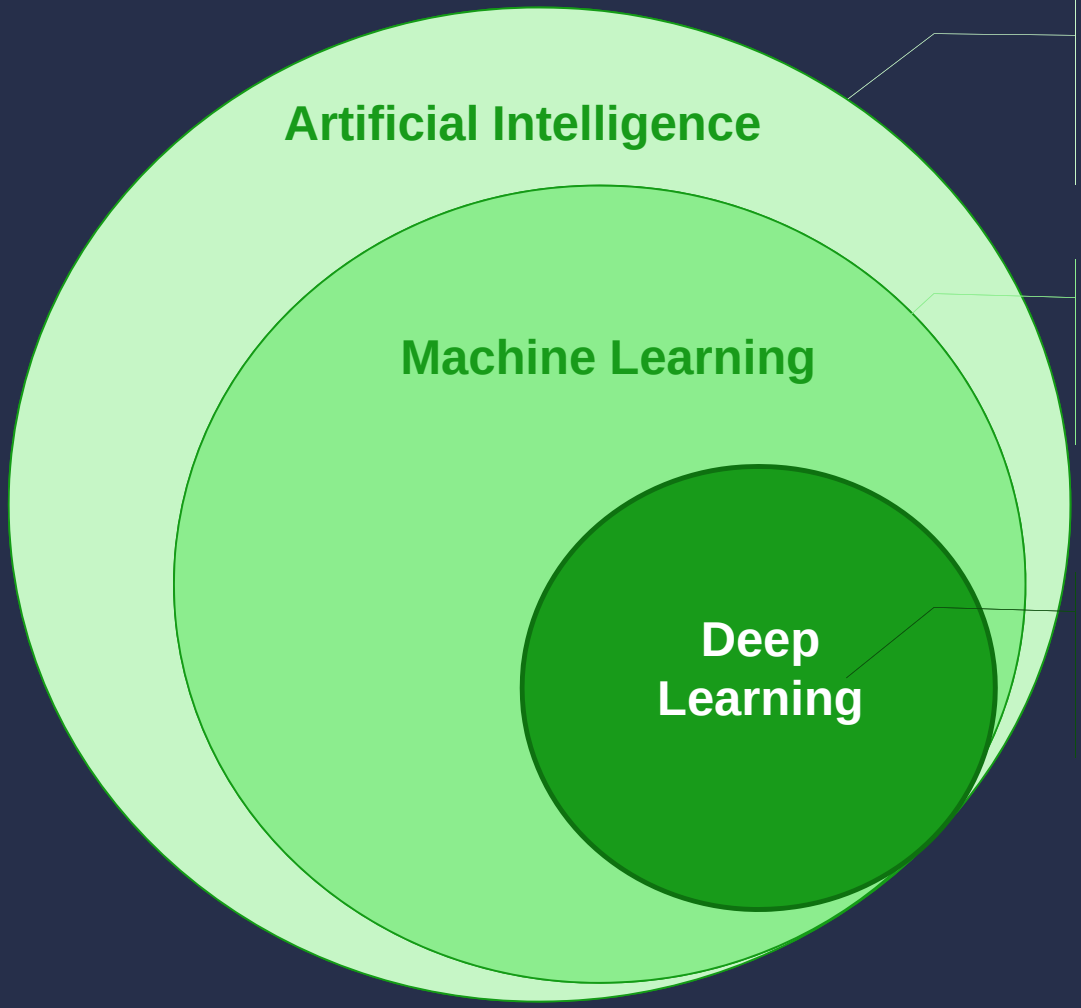
We plant seeds of capital in promising startups, nurturing them to produce the **highest possible returns** for our investors.

We are SpringTime Ventures.
It's time to grow.

WE BELIEVE



AI?
Machine Learning?
Neural Networks?
Deep Learning?

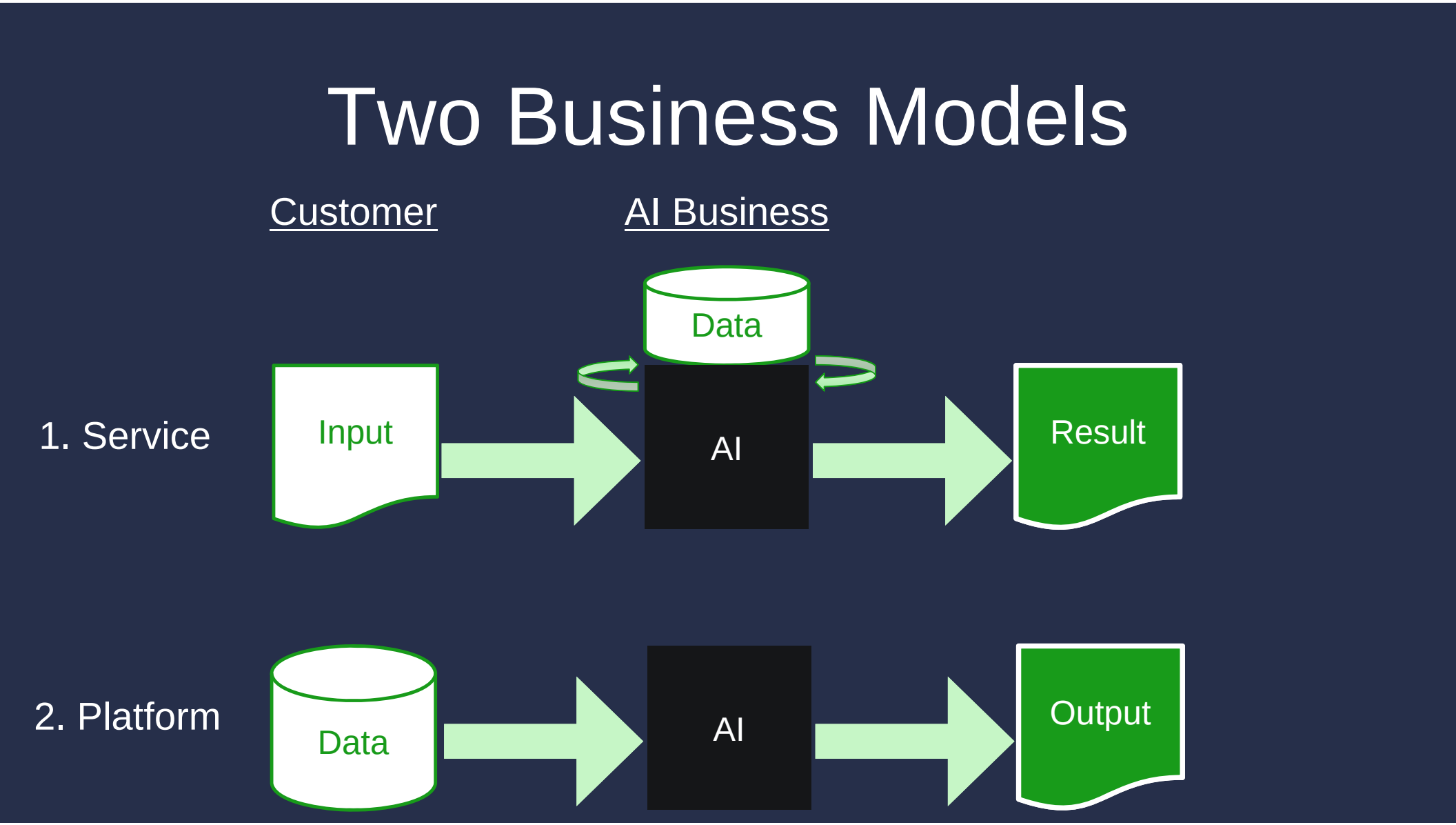


Artificial Intelligence is the broad concept of programs being able to carry out tasks in a way that we would consider “smart”

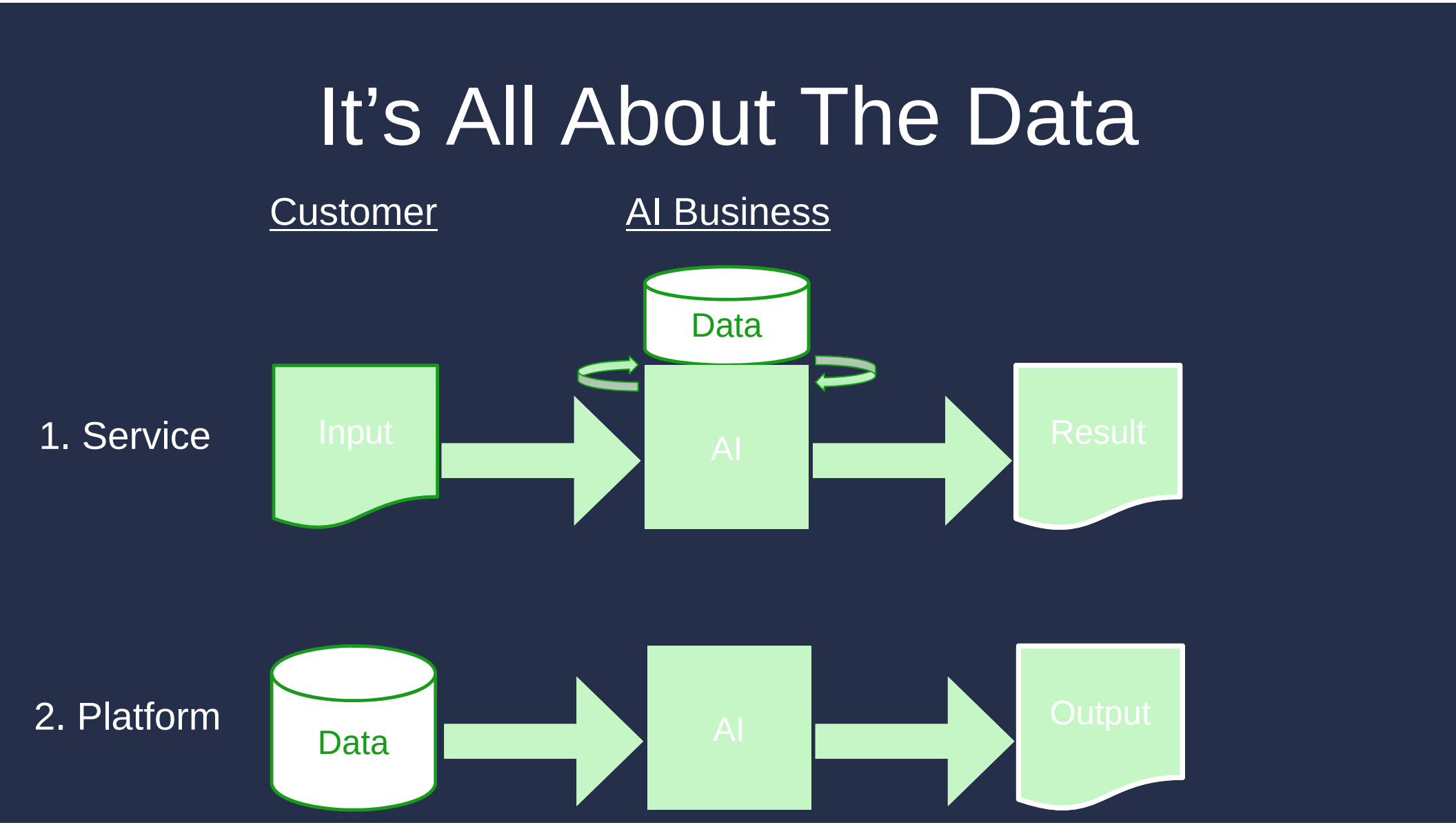
Machine Learning is giving programs access to data and letting them learn for themselves.

Programs capable of learning new lessons from data without being designed to explicitly learn those lessons.

Two Business Models



It’s All About The Data



Data Is The New Oil

Image: The Economist

Interesting Services

Blue River Technology

Intelligent machine vision solutions for agriculture

Sunnyvale, CA | Acquired by John Deere Sep 2017 $305M

Darktrace

Enterprise immune system technology for cyber security

Cambridge, UK | Raised $179.5M

CaliberMind

Unifying siloed customer data to drive sales

Boulder, CO | Currently in SpringTime due diligence

Interesting Platforms

Bonsai

Empowering enterprises to build intelligent systems

Berkeley, CA | Raised $13.6M

AlchemyAPI

Web services for real-time text analysis and computer vision

Denver, CO | Acquired by IBM 2015 | Powers most of Watson API's

DataDNA

Automates high quality, clean data that's ML ready

Denver, CO | Currently in SpringTime due diligence

SPRINGTIME VENTURES

Come grow with us.

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Appendix

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