Understanding Business Use of Data in an Age of AI

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Today's Goals

- To provide a 360 degree view of how AI is evolving

- Give you a perspective from which to plan your organization's storage strategy based upon

  - Your organization's unique place in the AI maturity curve

  - Understanding your organization's strategy around AI will be critical to accurate future state planning

![Genre-X Consulting logo — Better Business Through Data]

Background

- 10 years in Finance

- 10 years in Software and Technology

- 10 years in management consulting in advanced analytics and applied data science

- 1 year Founder and CEO of a management consultancy specializing in rapid adoption of "Enterprise AI"

- Author – "Enterprise AI – How to get started" set for release Feb. 2019

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- Personal fact – Lifelong surfer
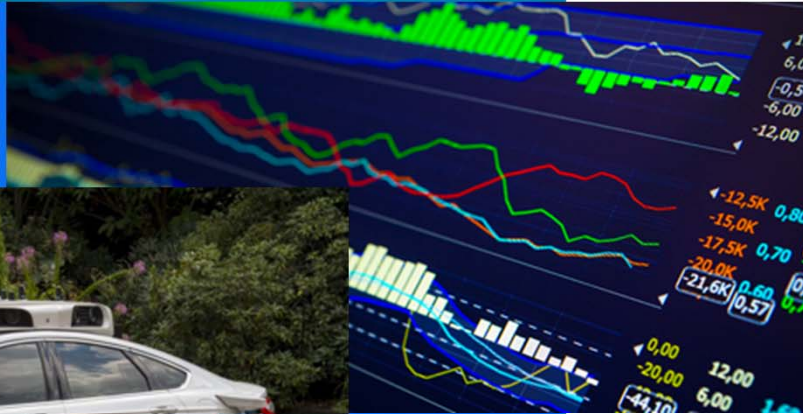
AI is Not New or Mysterious

- Mathematical algorithms in existence for decades

- Enabled by technology and fueled by data explosion

- Proliferation of embedded and point solutions

- Pervasive across many parts of our lives today

Cross-enterprise capabilities are emerging

The widening gap between what humans and machines can do

Then....

Now.....

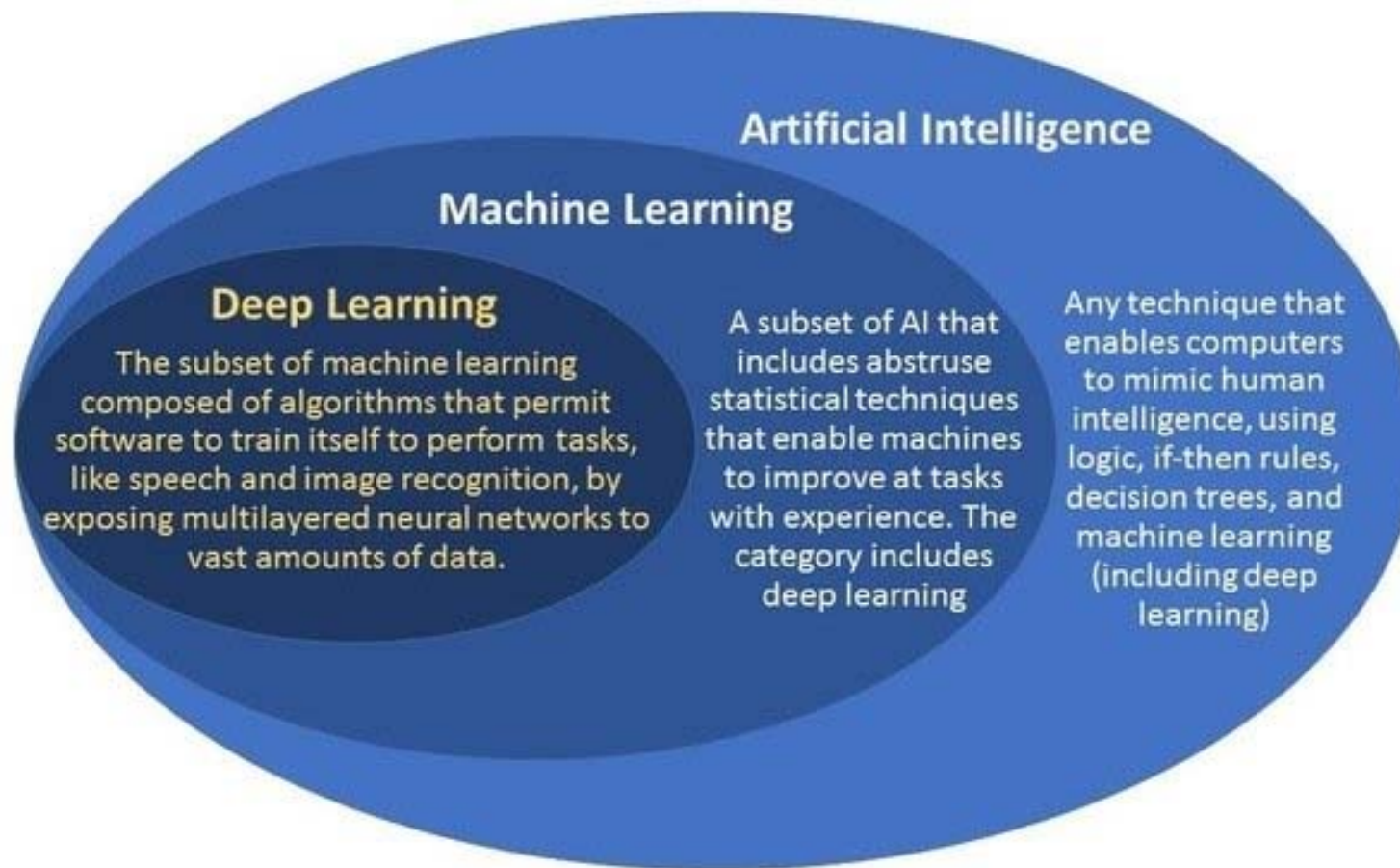# The definition has narrowed to the currently possible

Then....

- The study based on the conjecture that every aspect of learning or any other feature of intelligence can, in principle, be so precisely described that a machine can be made to simulate it.

Now.....

- The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision making, and translation between languages.
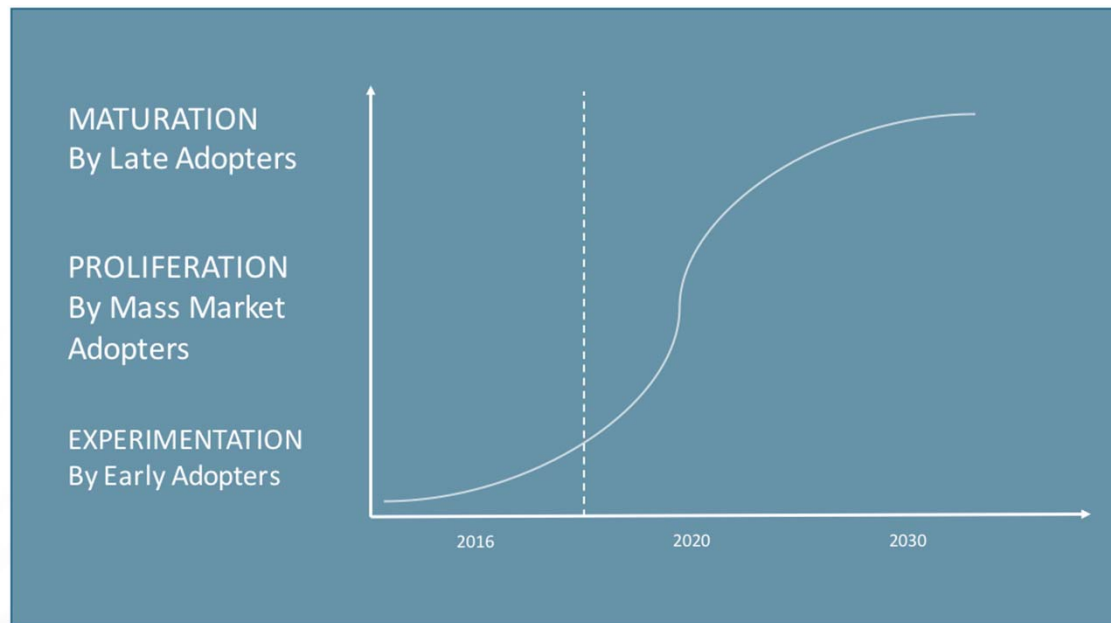
The Taxonomy

Artificial Intelligence

Machine Learning

Deep Learning
The subset of machine learning composed of algorithms that permit software to train itself to perform tasks, like speech and image recognition, by exposing multilayered neural networks to vast amounts of data.

A subset of AI that includes abstruse statistical techniques that enable machines to improve at tasks with experience. The category includes deep learning

Any technique that enables computers to mimic human intelligence, using logic, if-then rules, decision trees, and machine learning (including deep learning)

Here's how it evolved – user perspective....

	1985-95	1996-2010	2011->
	Traditional BI	**Performance Management**	**Enterprise Artificial Intelligence**
Data Complexity	Structured Data (RDB)	Data Marts/ OLAP	Dynamic Big Data (Structured and Unstructured)
Algorithm Sophistication	Dashboards and Visualizations	Custom Modelling with Standard Statistical Tools	Inferential NLP, Pattern Recognition, Machine Learning
Use Cases	Reporting History	Insight and Prediction	Goal Achievement & Automated Action

Explosion Of Data ● Need For Automated Action ● Driving Commercialization of AI for Business

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The Era of Enterprise AI

ADOPTION

MATURATION
By Late Adopters

PROLIFERATION
By Mass Market
Adopters

EXPERIMENTATION
By Early Adopters

2016   2020   2030

Sources: MIT, Boston Consulting Group, Harvard Business Review, McKinsey & Co., World Economic Forum

"The most important general-purpose technology of our era is artificial intelligence, particularly machine learning"

Erik Brynjolffson and Andrew McAfee, Harvard Business Review, July 2017

Today's Commercial Market by Operating Model

Big Data Architected

Google, Amazon, Uber, Priceline.com

Directly built on data and the ability to perform high volume compute

Emerging

Automotive, Insurance, Travel, Transportation

Siloed in use of data driven by opportunity to monetize

Traditional

Everyone Else

Evaluating where, how, and why to develop competency

Drivers and Enablers

Storage
Elastic Storage

Compute
Elastic Compute

Network
Software-defined Network

Tech developments

Cloud

CLASS CENTRAL

81M Students   800+ Universities   9.4k Courses

By the Numbers: MOOCs in 2017

MOOC and Universities

Application proliferation

Digital Transformation
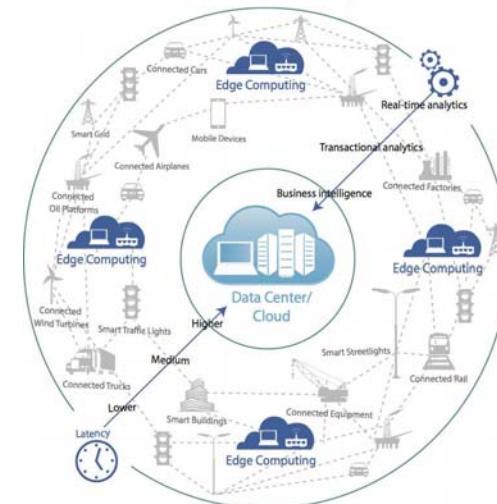
IOT and Sensors

Challenges

Market complexity

MDM

Integration

Current Initiatives

And Strategically:
- Collective Understanding and Ownership by the C-Suite
- Cultural and Organizational Change Necessary
- Interpretability and Repeatablitiy
- Impact of GDPR

Many Adopt A "Build" Stack

WORKBENCH FUNCTIONALITY

USER BENEFIT

Digital Platform

Visualization: Websites that host visualizations accessible to customers hosted on cloud services or on cloud infrastructure

Present findings using previously costly visualizations (e.g. WordPress, Custom Built Drupal-Based Site, Tableau, QlikView, etc.)

Processing: Analytical software tools either offered as a service on the cloud or hosted on cloud infrastructure

Explore with industry leading analytics tools (e.g. R Server, Jupyter Server, Tableau Server, SAS Server, DataBricks, Spark on EMR, etc.)

Storage: Cloud based platform-as –a- service solutions for file storage, relational databases, and NoSQL databases

Collection and access to Government Data Sets (e.g. U.S. Census Bureau, Open Grid, IRS Anonymized Data, Data.gov, etc.)

Data Sets

Booz Allen Hamilton – Data Science Workbench

But......Business Likes the "Buy" Stack – r4 Example

Score Every Store for Potential and Consumer Alignment 〉 **Manage Priorities to Address Changing Goals** 〉 **Sell the Right Products to the Right Places** 〉
- **Product Placement**
- **Revenue Growth**
- **Margin Improvement**

Shipments

MSA / VIP

Retail POS

Nielsen

Piney Bowes

Demographics

Traffic Patterns

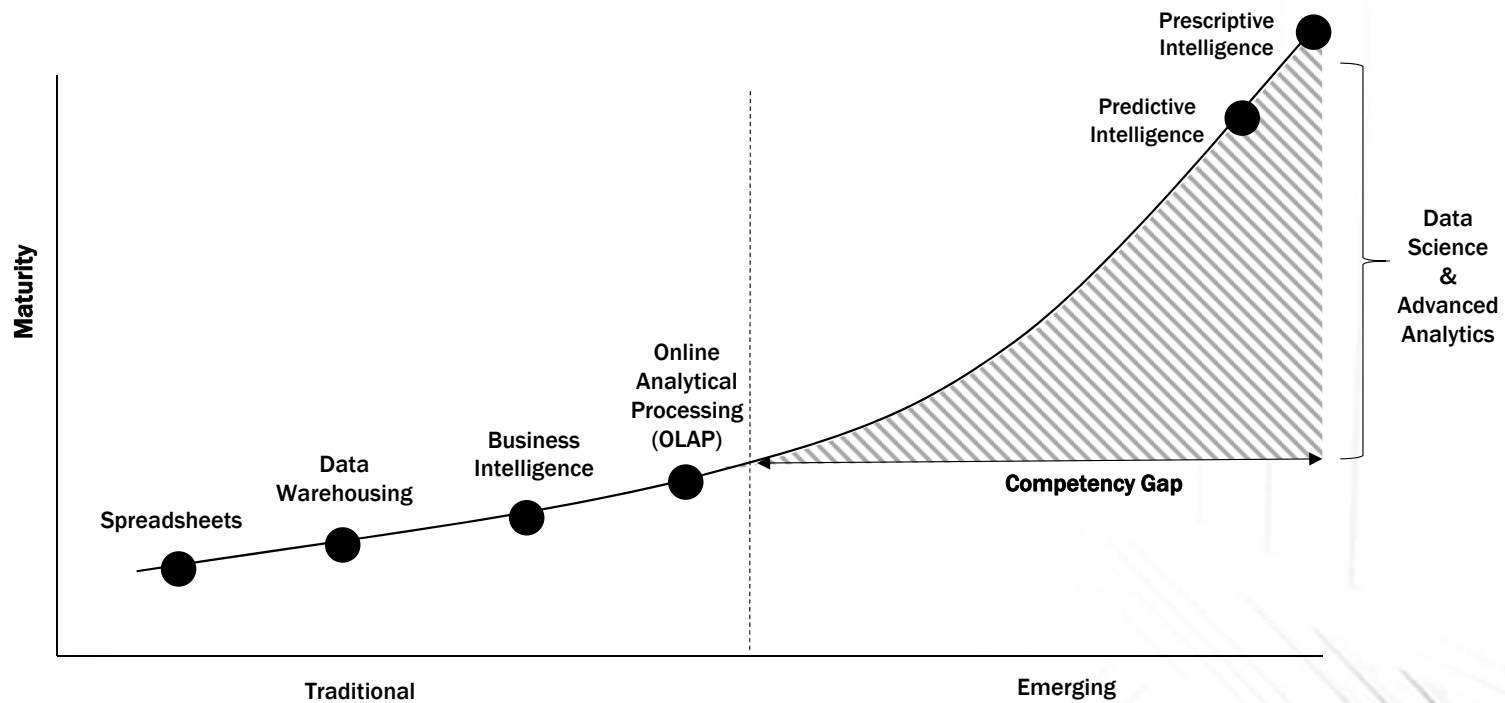Real Estate Value

Proximities

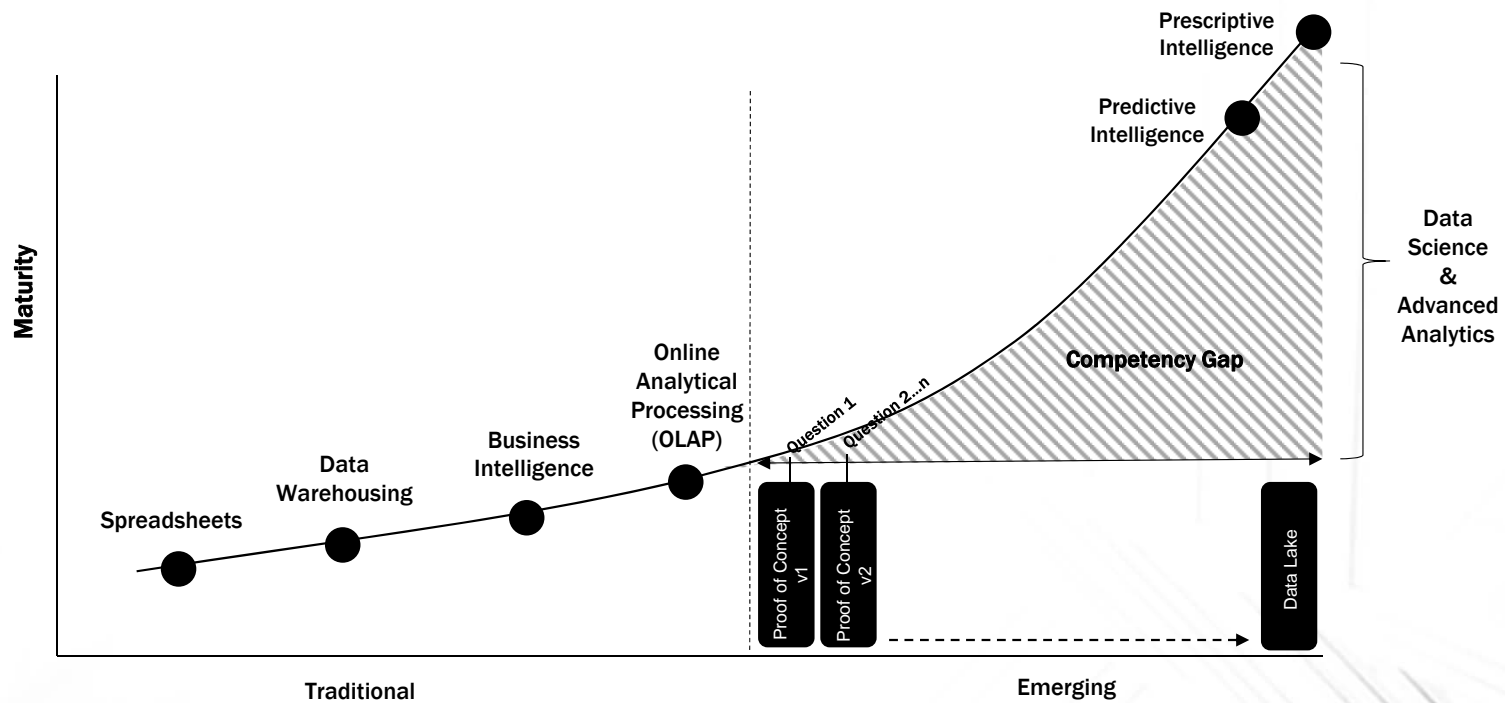Equipment Telemetry

Consumer Research

Financial Stress

Social Media

Analytic Maturity "Chalk-talk"

Analytic Maturity "Chalk-talk"

Latest Thinking – How Will This Space Evolve?

Outlook :

- Continued convergence in technology to support increasingly sophisticated approaches to insights and predictions

- AI adoption will continue to force changes to existing business models

- Business strategy will determine where companies begin to apply data science

- The aspirational goal of "Enterprise AI" will drive accelerated adoption

Data Retention Trends

FUTURE DIRECTIONS FOR NSF ADVANCED COMPUTING INFRASTRUCTURE
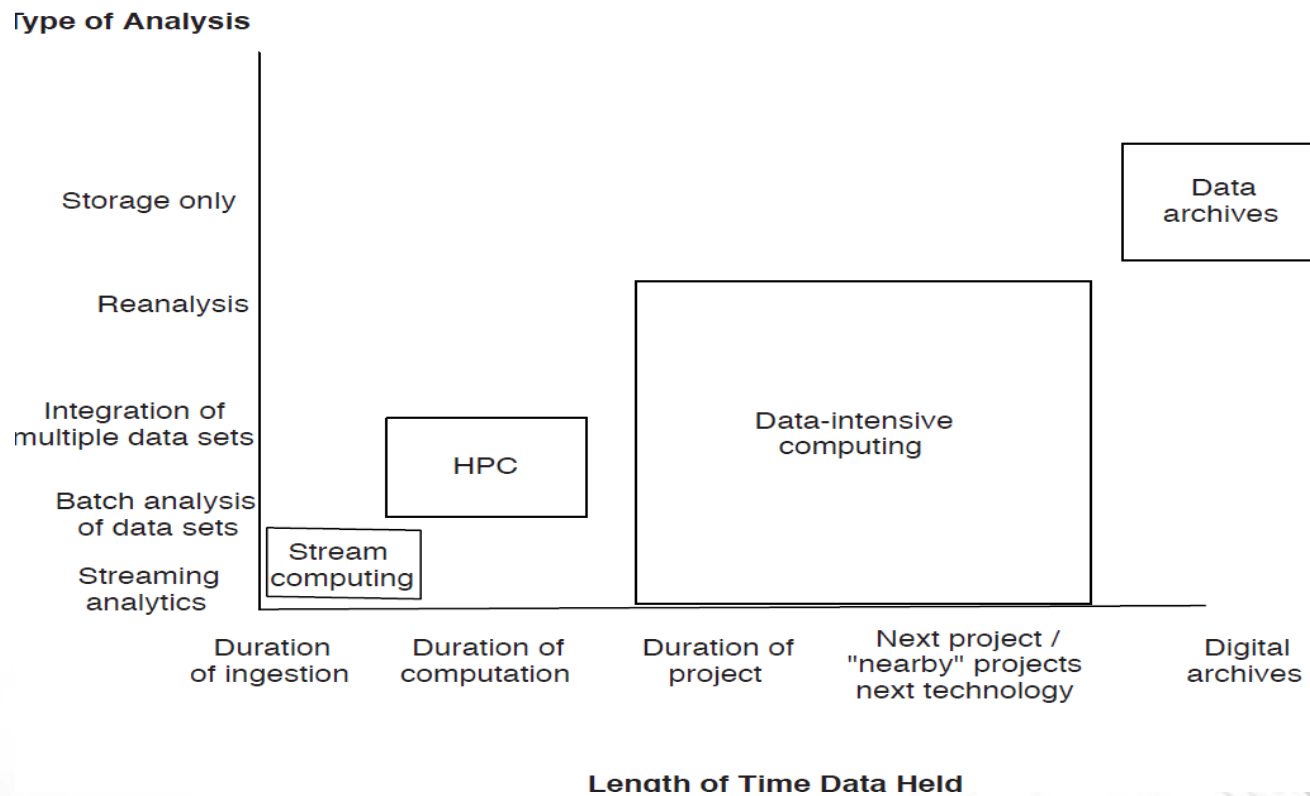
Storage Planning Implications

- The performance metrics used today to evaluate storage needs will broaden

- Storage performance automation and monitoring tools will be critical as orgs develop new data useage patterns that are currently unknown

- Business user maturity will exert greater analytic demands that impact IT decision making

- Adjustments to the capacity planning process – driving towards more of a "rolling fcst approach"

- Storage and compute planning will require focus, but in a increasingly holistic context

- The Tiered approach norms of today will evolve– but understanding what your users are likely to do is key

- As volumes of data increase exponentially, costs will play a larger role – across storage, compliance, governance, encryption, integration, performance

Most of all – Enjoy the Ride!