



**TeraCrunch**

*Data Science Solutions & Services*

# Agenda

- Who is TeraCrunch
- Key Ingredients of Data Science & Big Data Analytics Projects
- Use Cases – application of innovative analytics in Healthcare
- How to start the journey

# Who is TeraCrunch

- Eco-system of custom solutions, people & process improvement
- We see analytics as behavioral science rather than IT
- Eclectic team of PhD Data Scientists & Healthcare experts
- Our team has built over 1000 analytical tools
- Have over 150 yrs. of cumulative data science experience
- Rapid prototypes in 1-3 weeks, full scale solutions in 4-6 weeks

# Highly Experienced Data Scientists with Healthcare Expertise

**Dr. NAVEEN ASHISH | Co-founder & Data Scientist**



- Associate Professor: USC, Informatics
- Authored books in Semantics & Artificial Intel.
- Computer Scientist@NASA AMES Research
- MS & PhD in CS - USC, BS in CS – IIT

**Dr. KEVIN PAYNE | Co-Founder & Lead Data Scientist**



- Research Methodologist & Statistician
- 40 research papers & over 8,000 students
- Asst. Prof. & Program Coordinator, Park Univ
- Visiting Asst. Prof., University of Mo
- PhD in Sociology & Psychology, Univ of Mo

**Dr. PRAMOD GUPTA | Sr. Data Scientist**



- Data Scientist roles at GE Research, Cognizant/VISA
- Research Scientist, NASA AMES
- Scientist, CAIR, India
- PhD in Computer Engg, McMaster Univ

**Jim Bobowski | Principal Data Scientist**



- 20+ years of Data Science Experience
- Mgmt positions Sony, Panasonic, Sprint
- Expert in solving problems and building models
- Illinois State University, Marketing/Management

**HARSHAL PATNI | Sr. Data Scientist & Ontologist**



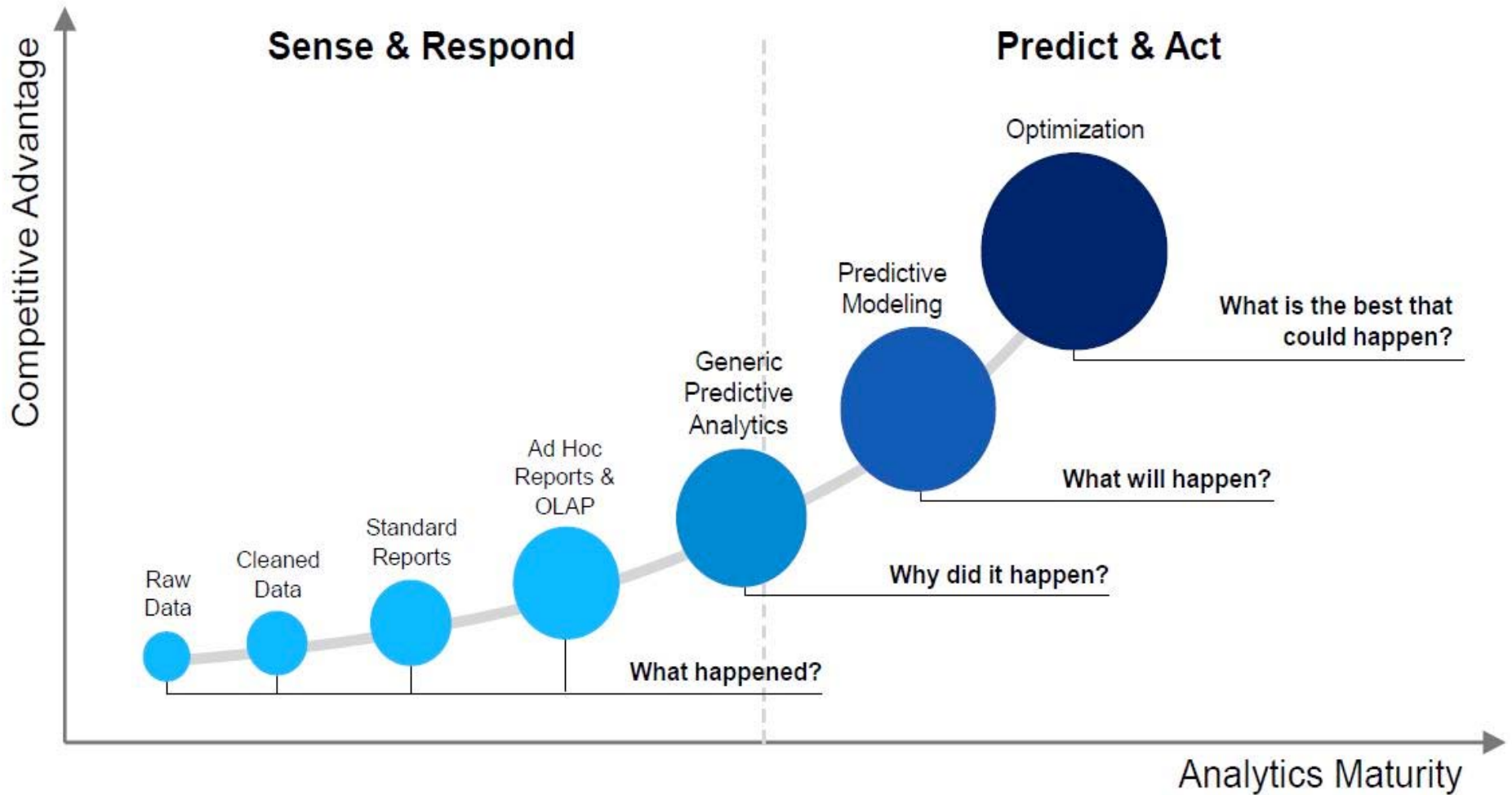
- Data Scientist, Next Technology
- Data Analyst, Ohio Knowledge-enabled computing
- MS in Computer Science, Wright State Univ

**Dr. SIVARAM ARABANDI | Sr. Data Scientist**



- Owner at Ontopro - Applied Clinical Informatics
- VP Healthcare Technology, Evolvers Group
- Clinical Informatics Consultant
- MBBS in Medicine, Masters in Surgery, Masters in Computer Science

# Analytics Value Chain



# Key Ingredients of Data Science & Big Data Projects

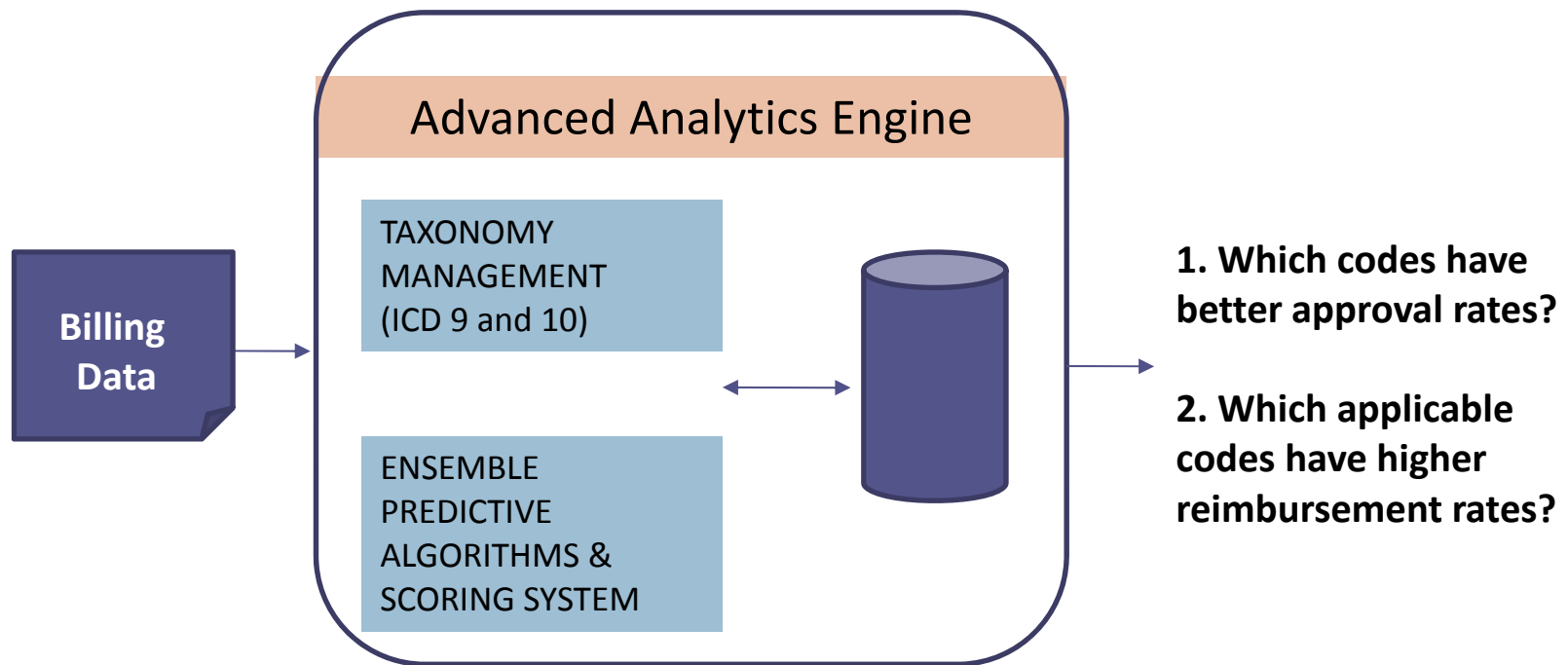
- True “big data” approach takes advantage of all available information, but can start with a few sources
- Designed for self-learning, scale and speed
- Employs & integrates best in class statistical, machine learning algorithms, and medical & behavioral knowledge engineering components
- Knowledge engineering is vital for algorithms to understand “context” and “reasoning” from the data, like humans do
- Iterative development trajectory, start small fast, learn & scale

# Predictive Analytics Applications In Healthcare

# HEALTHCARE BILLING & REVENUE OPTIMIZATION ANALYTICS

**Problem** Since many diseases can be alternatively classified under more than one ICD-9 or ICD-10 code, and since the impending migration to ICD-10 opens new possibilities to establish billing standards, there is a need to mitigate your operational and financial risks.

**Solution** An intelligent, data driven analytics tool and a dashboard



**Result & Benefits** Interactive dashboard, Increased Revenue, Speedy reimbursement, Ability to compare different Physician's coding habits and improve coding processes



## OTHER BENEFITS

- Built-in ICD-9 to ICD-10 transitional trajectory that baselines practitioner behavioral choices and projects ICD-10 tendencies
- Can be used by Providers of any size
- Payers can also use our solution
  - Payers want to find Providers who over-bill
  - Payers want to re-negotiate contracts with Providers who over-bill
  - Instant Revenue impact

# PREDICTIVE ANALYTICS TO UNDERSTAND PHYSICIAN'S PRESCRIPTION HABITS

**Problem** Analyze physician prescription data to segment physicians based on their prescription habits

**Solution** Segment, classify and built a 3 dimensional segmentation framework showing how various types of physicians prescribe this particular medication and what influences their prescription habits.

**Result & Benefits** Repeatable model. Helped Pharma client improve their marketing strategy and increase their client base.



# How to start a data science engagement

1. Start with a “wish list” of business problems you wish to solve
2. Perform a data assessment and pick one problem. Low hanging fruit with high ROI
3. Build a solution in a small iteration, verify results
4. Scale – add new data sources, new features, tune results constantly

# Q&A

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# Real-time Personalized Recommendation Engine For Therapeutic Treatments

## Problem

Identify which treatments were working and recommend improved treatment strategies

## Solution

We deployed machine learning and statistical algorithms to accomplish 3 goals:

- early detection of suboptimal clinical results
- recommendations for improved behavioral therapies
- recommendations for continuing therapies to reinforce desired behaviors

## Result & Benefits

A system that monitors treatments across thousands of cases in real time and generates optimal recommendations tailored to individual characteristics and environments.

## Data Source

Therapist notes and metrics generated through portal.

