

2015 HOSPITALITY LAW CONFERENCE

FEBRUARY 9-11, 2015

USE OF ANALYTICS IN DEALING WITH FRAUD & CORRUPTION IN THE HOSPITALITY INDUSTRY

Presented by:

Imran Hayat, Esq.

Michelman & Robinson, LLP

Dan Kritzman

Deloitte Transactions and Business Analytics LLP

Anthony Campanelli

Deloitte Financial Advisory Services LLP



PRESENTERS



Imran Hayat

Senior Counsel, Michelman & Robinson

- ❖ Imran Hayat is a skilled and highly versatile litigation attorney, handling sophisticated issues in hospitality, real estate, banking and intellectual property
- ❖ Mr. Hayat's clients include hotels, Fortune 500 banking and financial institutions, as well as real estate and technology companies
- ❖ Mr. Hayat has significant experience in the hospitality industry, representing hotels in a myriad of real estate matters.



Anthony Campanelli

Shareholder, Hoteliers United Incorporation

- ❖ Mr. Campanelli is a Partner in Deloitte's Forensics practice and has almost 18 years of experience in providing consulting services to companies and law firms in a wide range of matters, including securities litigation, buy-sell disputes, forensic accounting and fraud/anti-corruption investigations
- ❖ He is a CPA in the States of New York and New Jersey and has earned the credential of Certified in Financial Forensics (CFF) by the AICPA. Mr. Campanelli specializes in the travel, hospitality, and leisure sectors and has been quoted in several media outlets on various fraud, environmental, and compliance issues impacting the hospitality and gaming industry



PRESENTERS



Dan Kritman

National Data Analytics Leaders, Deloitte

- ❖ Mr. Kritman is the National Data Analytics Leader in Deloitte's FAS Analytics service area and has more than 20 years' experience specializing in the analysis of electronic data
- ❖ His experience includes analysis of complex data sets, management of Deloitte's FAS Analytics Institute (advanced analytics and predictive modeling), the design, development, and implementation of numerous information management systems and client applications, and the operation of relational databases in anti-fraud/bribery, investigative, litigation, claims processing and settlement administration environments
- ❖ Mr. Kritman has experience with relational databases, data visualization and ETL tools, and accounting software, and is a co-creator of several proprietary tools



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FRAUD & THE HOSPITALITY INDUSTRY

Overview

The SEC

The FCPA

Compliance Programs

Loyalty Programs

Conclusion



OVERVIEW

How fraud and corruption impact the hospitality industry

Kinds of hospitality fraud and corruption

Mechanisms for dealing with fraud and corruption



THE FCPA

The Foreign Corrupt Practices Act of 1977 is a way the U.S. combats corruption

- If business has a formal tie to the U.S.
- If business commits a violation in the U.S.
- Multiple industries, including Hospitality



COMPLIANCE PROGRAMS

Hotel and hotel vendor programs

- Staffing and resources
- Culture
- Clear policies
- Regular program updating
- Training
- Due diligence
- Audits
- Certifications
- Incentive programs



LOYALTY PROGRAMS

Hotbed of fraud

- By employees
- By business partners
- By criminal organizations

Red flags for fraudulent rewards programs usage

- Surge of time spent on database
- Redemption activity variance
- Numerous poor login attempts
- Uncommon profile updates and shipping changes



TECHNOLOGY/BRIDGE TO ANALYTICS

Leveraging data across business units

Technology and visualization tools

The use of third parties

Advanced analytics



OVERVIEW OF TODAY'S DISCUSSION

The Age
of Analytics



Predictive
Analytics



Behavioral
Applications



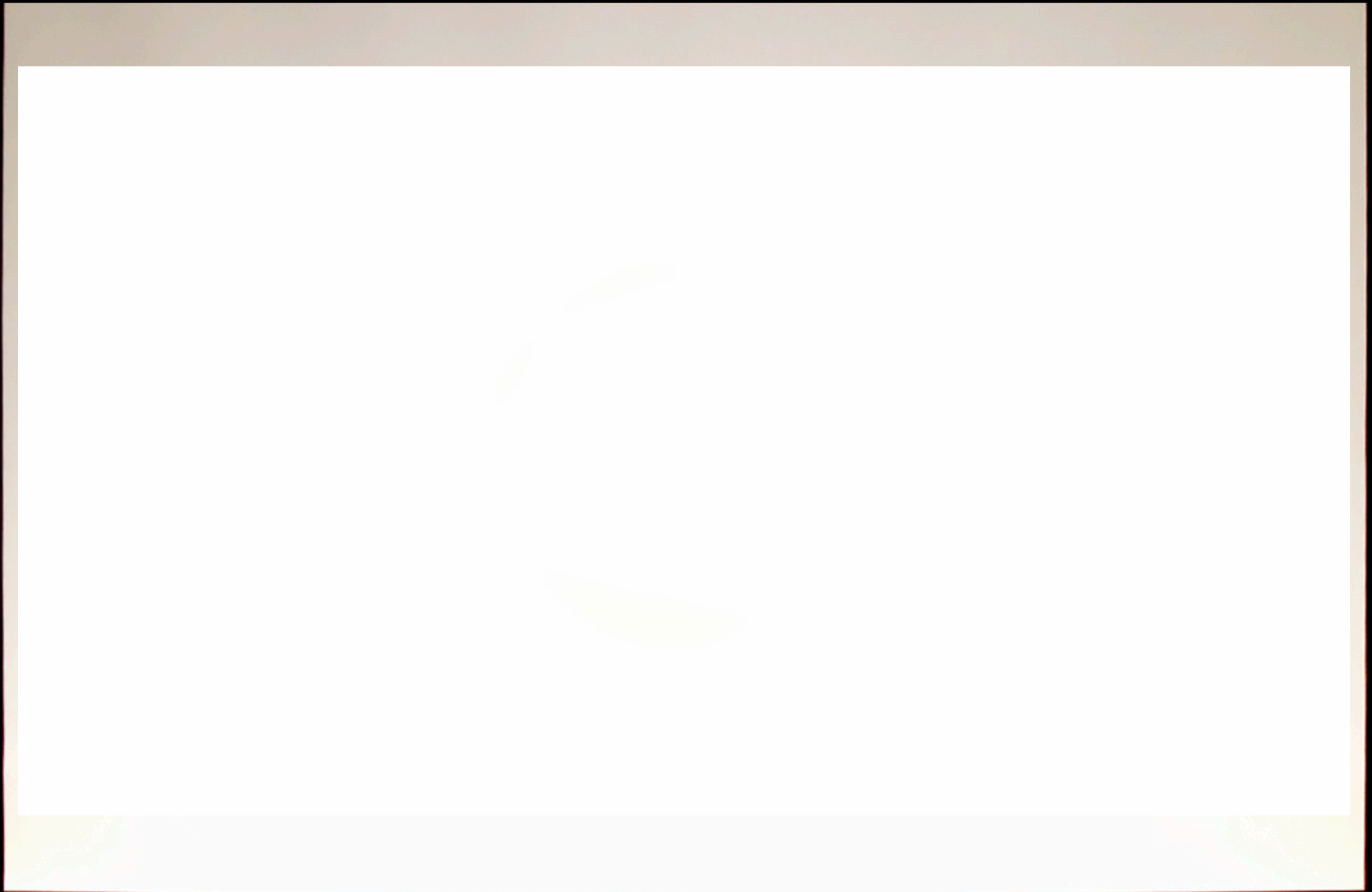
Final
Thoughts



PART I: THE AGE OF ANALYTICS

The Age
of Analytics





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ANALYTICS IS...



Advancing at an
exponential rate

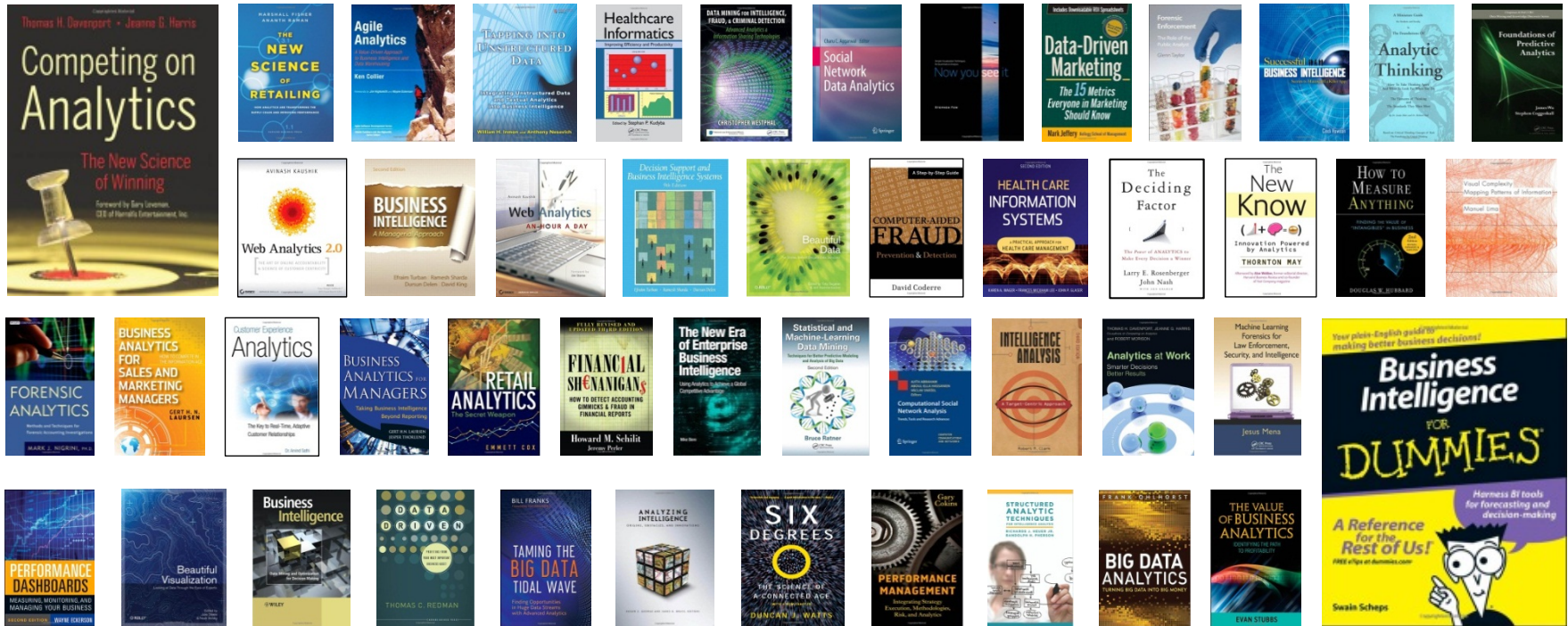


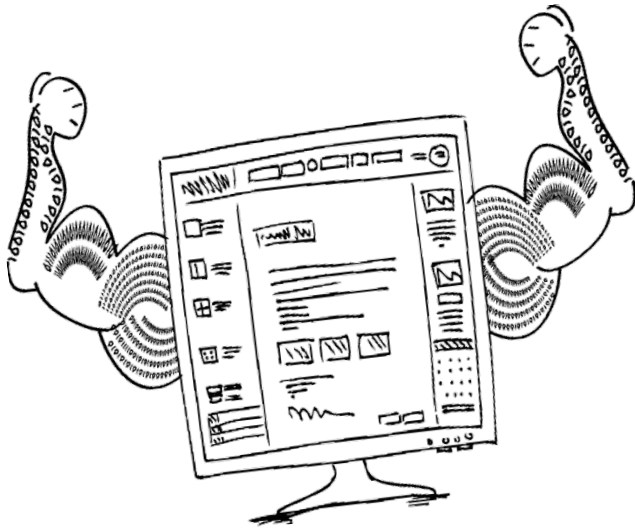
Applicable across
an **enormous spectrum**
of industries

Something you should
start **thinking more**
about today



ANALYTICS AND THE MEASUREMENT EXPLOSION

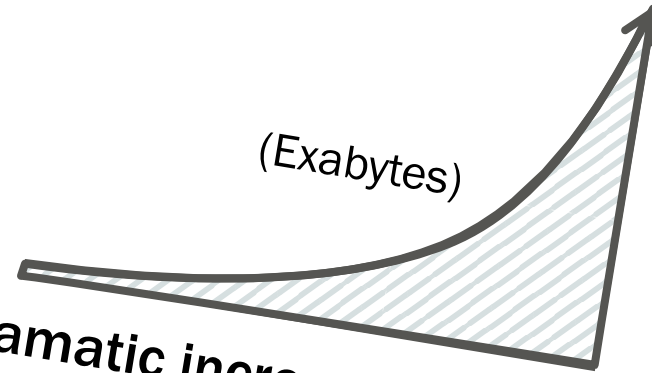




Dramatic increase in computing power



Dramatic increase in the speed at which data can be transferred and accessed



Dramatic increase in the volume of data and the storage thereof



Dramatic increase in the ability to model, to predict, and to analyze information

In 1969, we put two men on the moon.

Your cell phone today has more computer power than all of
NASA in 1969.





\$3398

10 MB

THE HARD DISK YOU'VE BEEN WAITING FOR

XCOMP introduces a complete micro-size disk subsystem with more...

- **MORE STORAGE**
- **MORE SPEED**
- **MORE VALUE**
- **MORE SUPPORT**

The XCOMP subsystem is now available with 10 megabytes of storage, 5 megabytes also available at \$2,898.00. Compare the price and features of any other 5 1/4-inch — or even 8-inch system, and you'll agree that XCOMP's value is unbeatable.

OUTPERFORMS OTHER HARD DISKS

Floppy disk and larger, more expensive hard disks are no match for this powerful SMI system. More data is available on every seek: 64K on 10MB and 32K on 5MB. Faster seek time too — an average of 70MS, it provides solid performance anywhere with only 20 watts of power. Data is protected in the sealed enclosure, and the landing zone for heads provides another margin of safety. The optional power board plugs directly into the S100 bus and provides power for the drive.

FAST CONTROLLER

The XCOMP controller is the key to this system's high efficiency operation. Speed-up features include interleaves without table lookup, block-deblock with controller buffer, and read lookahead. OEMs worldwide have already proven the outstanding performance of the XCOMP controller.

MORE SOFTWARE

Included with the system is software for testing, for installing I/O drivers for CP/M[®], plus an automatic CP/M driver attach program. Support software and drivers for MP/M[®] and QDOS[®] are also available. The sophisticated formatting program assigns alternate sectors for any weak sectors detected during formatting, assuring the lowest possible error rate — at least ten times better than floppies.

WARRANTY

The system has a full one-year warranty on parts and workmanship.

ALSO AVAILABLE FROM XCOMP

- General Purpose controllers (8 bit interface), with easy interface to microprocessor-based systems
- GP controller adapter that plugs directly into most Z80 computers.
- S1/R GP controller for the 5MB and 10MB drive above, with ST506 type interface.
- S2/R GP controller for SA1000 interface.
- S3/R GP controller for storage module drives.
- S1/S, S2/S, and S3/S, same as above, for the S100 bus.

Quantity discounts available. Distributor, Dealer, and OEM inquiries invited.

See your local Dealer, or call

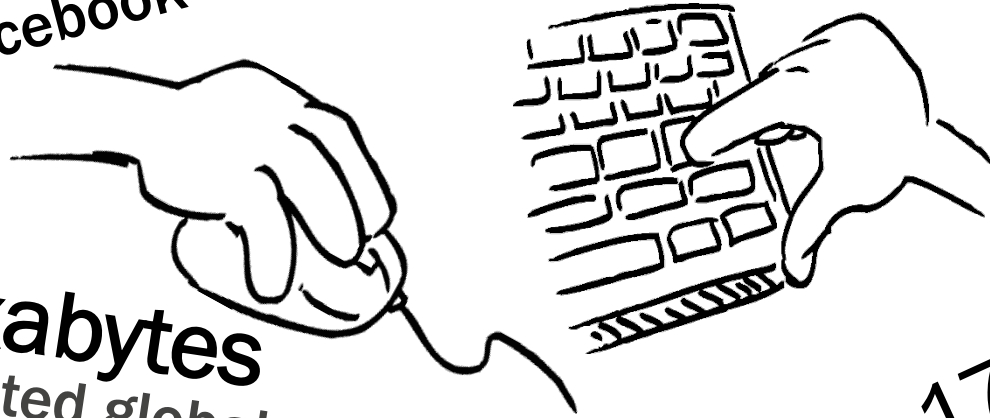


XCOMP, Inc.
7565 Trade Street
San Diego, CA 92121
Tel. (714) 271-8730
Telex: 182700

Circle 48 on Inquiry card.

100 TBs
of data are uploaded to
Facebook daily

300 billion
Emails sent daily

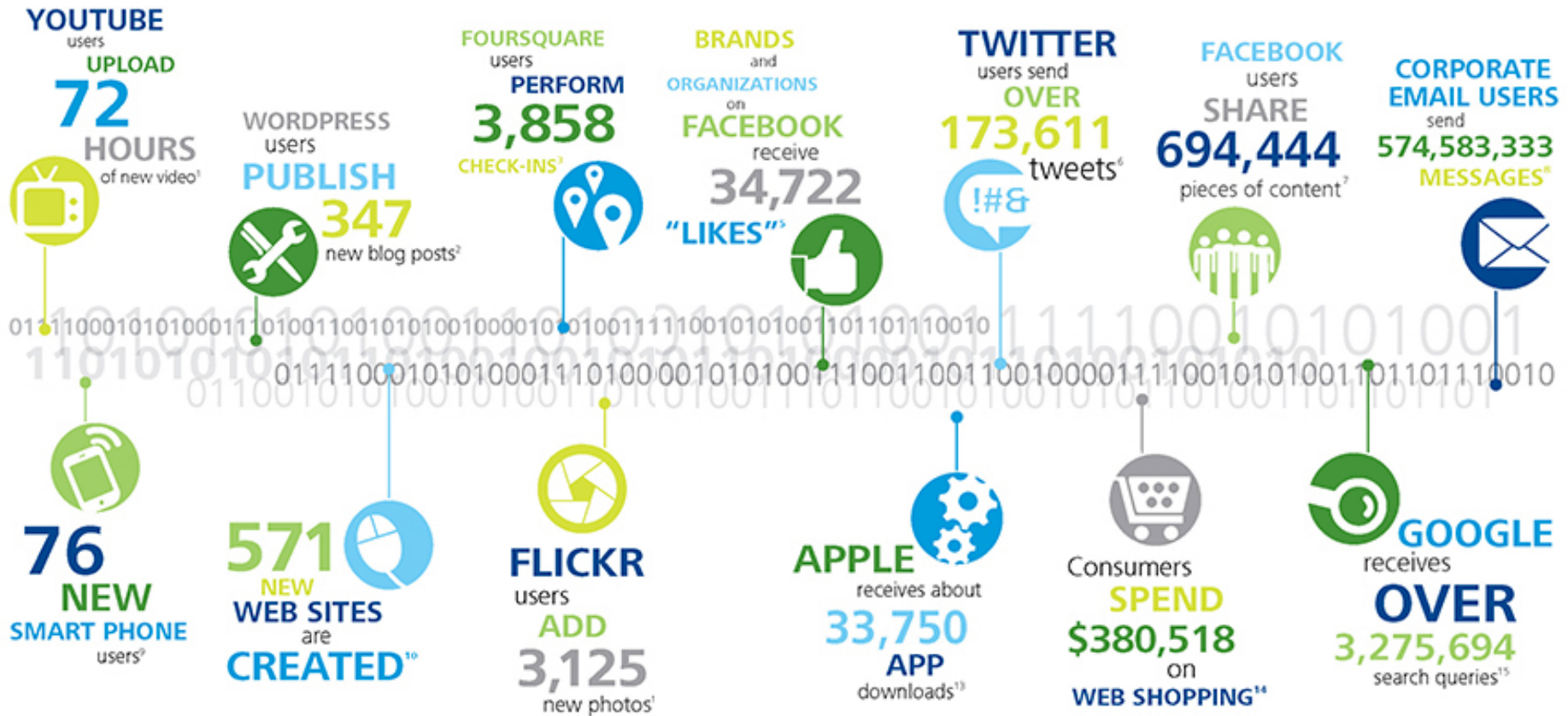


1.3 exabytes
Estimated global
mobile data traffic per
month in 2012

175 million
tweets sent
every day throughout
2012



HOW MUCH DATA IS GENERATED EVERY MINUTE?



Cisco's fastest routers are equipped to move **322 Terabits per second**. That's equivalent to:

- Every motion picture ever created to be **streamed in less than four minutes**;
- The entire printed collection of the **Library of Congress** to be downloaded in just over **one second**;
- Every man, woman and child in **China** to make a **video call**, simultaneously



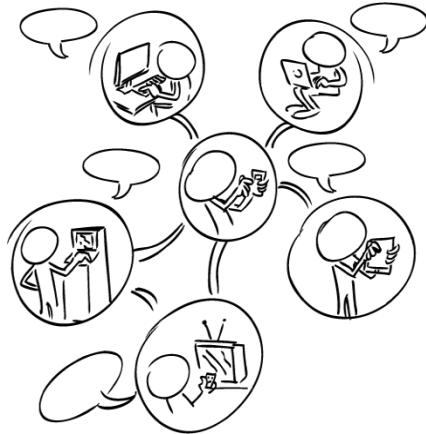
Text Analytics



Geospatial Analytics



Social Network Analysis



Predictive Analytics



TEXT ANALYTICS



TEXT ANALYTICS



Analysis of data contained in natural language text, such as documents, emails, and tweets.

Automated categorization, clustering, information extraction, sentiment analysis and many other tasks

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam pellentesque imperdiet pretium. Quisque ac augue sit amet odio vestibulum porta. Mauris nibh nibh, vestibulum non, dignissim ac urna. Aenean mi est. Maecenas vitae Maecenas auctor, magna et rhoncus bibendum, urna risus tempor ante, id idum turpis ligula a massa. Aliquam lobortis aliquet augue, nec blandiam auctor eget. Nunc congue massa vitae est ultricies feugiat in vitae enim. Curabitur semper tellus eu nulla blandit a rutrum diam faucibus. Aliquam erat volutpat. Donec euismod hendrerit nulla, vitae molestie enim vehicula vitae. Nec nec ligula vel dui viverra nunc. Cras tristique leo in lacinia pharetra luctus. Phasellus in interdum tortor. Pellentesque euismod, scelerisque vel lobortis ac, mollis vel nulla. In hac habitasse platea dictumst.

SENTIMENTS



ENTITIES



RELATIONSHIPS



METADATA



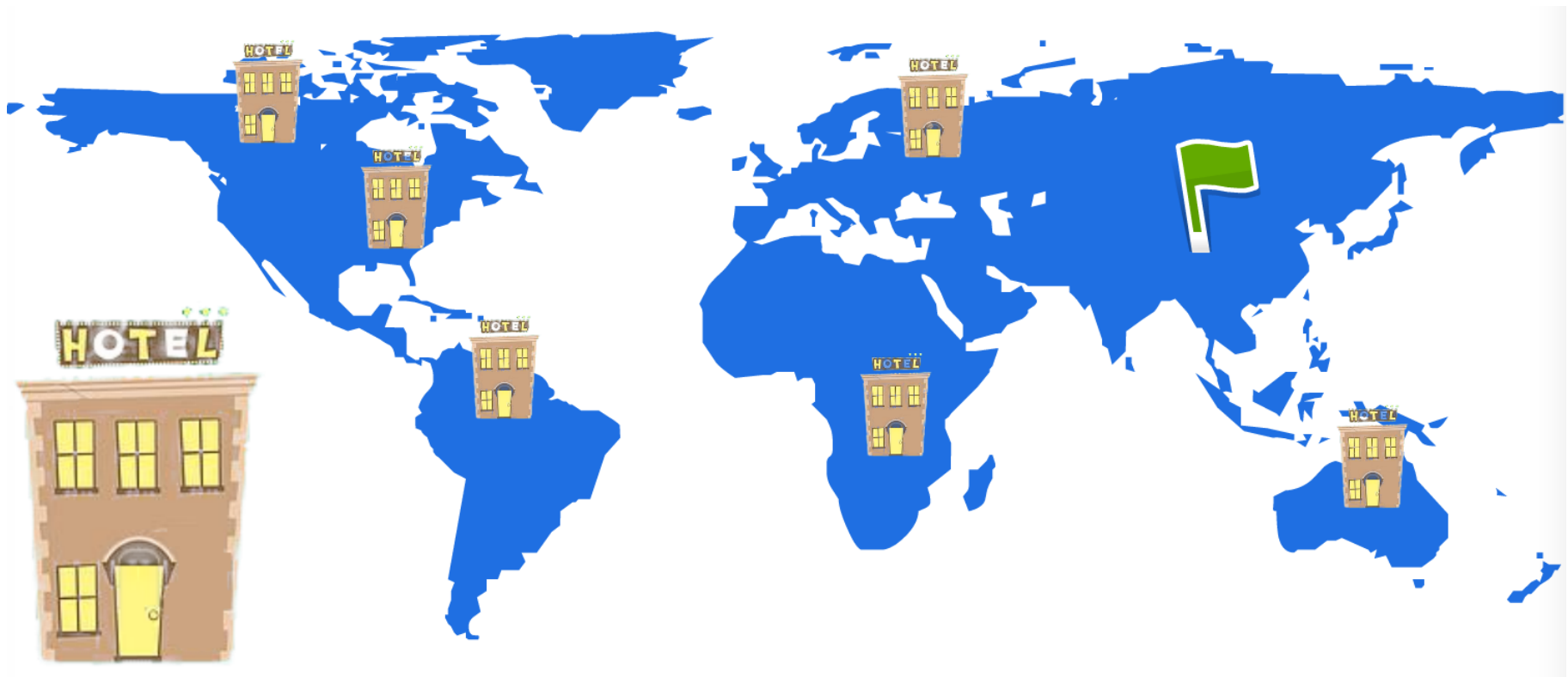
PATTERNS

GEOSPATIAL ANALYTICS



GEOSPATIAL ANALYTICS

Analyzing location-based data to uncover geographic trends, patterns, and opportunities



SOCIAL NETWORK ANALYTICS

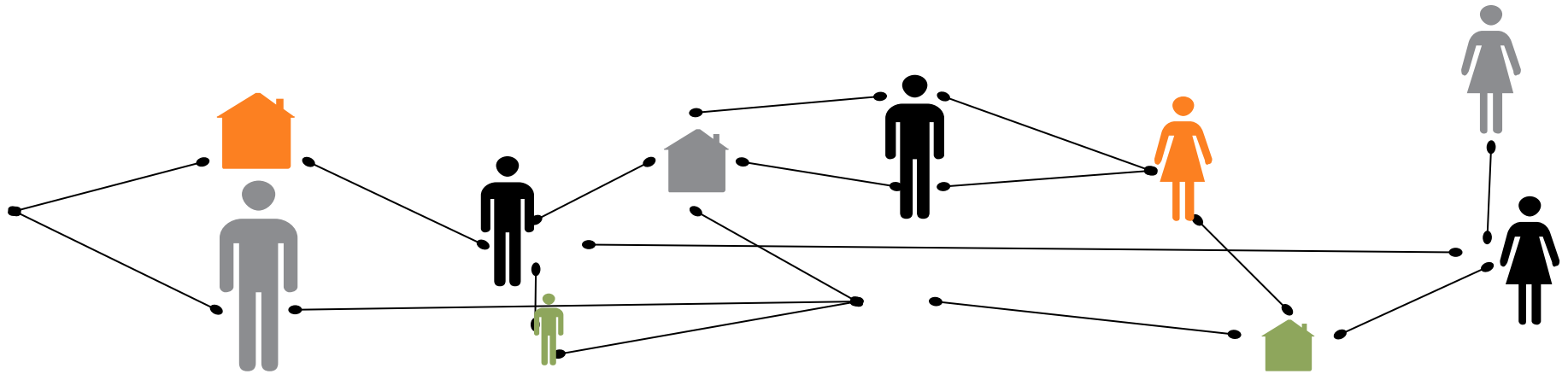


SOCIAL NETWORK ANALYSIS



Mapping relationships between people and entities.

- Target guests based on their association with other entities
- Identify key players and influencers
- Expose bad actors and limit their risk to your network



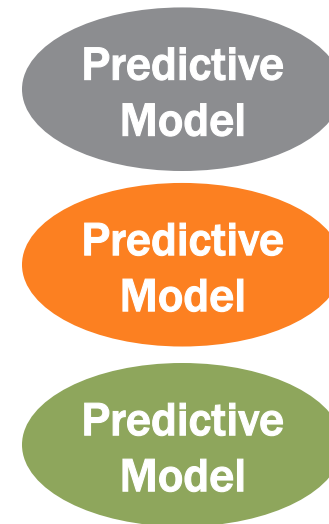
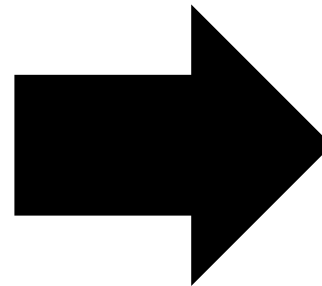
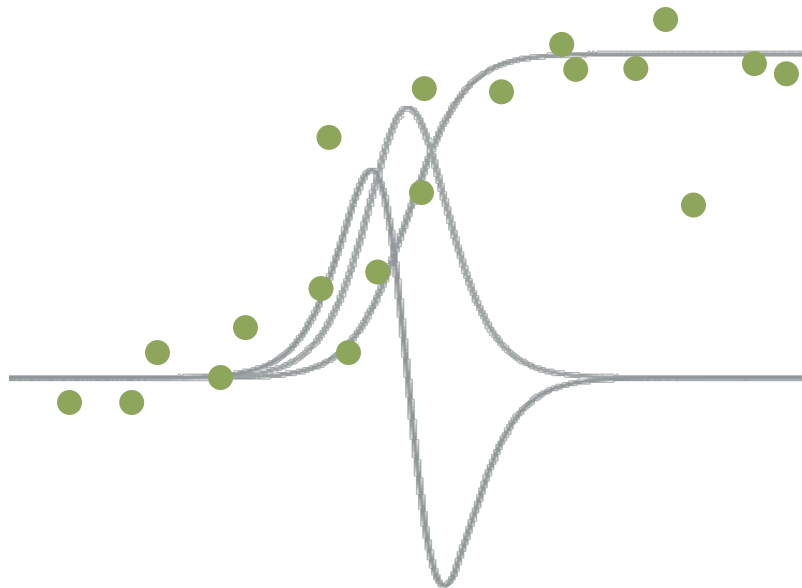
PREDICTIVE ANALYTICS

PREDICTIVE ANALYTICS



Applying statistical and machine-learning techniques to forecast likely outcomes.

- Predict behavior based on correlation of past events
- Not based on prior human knowledge



PART II: PREDICTIVE ANALYTICS

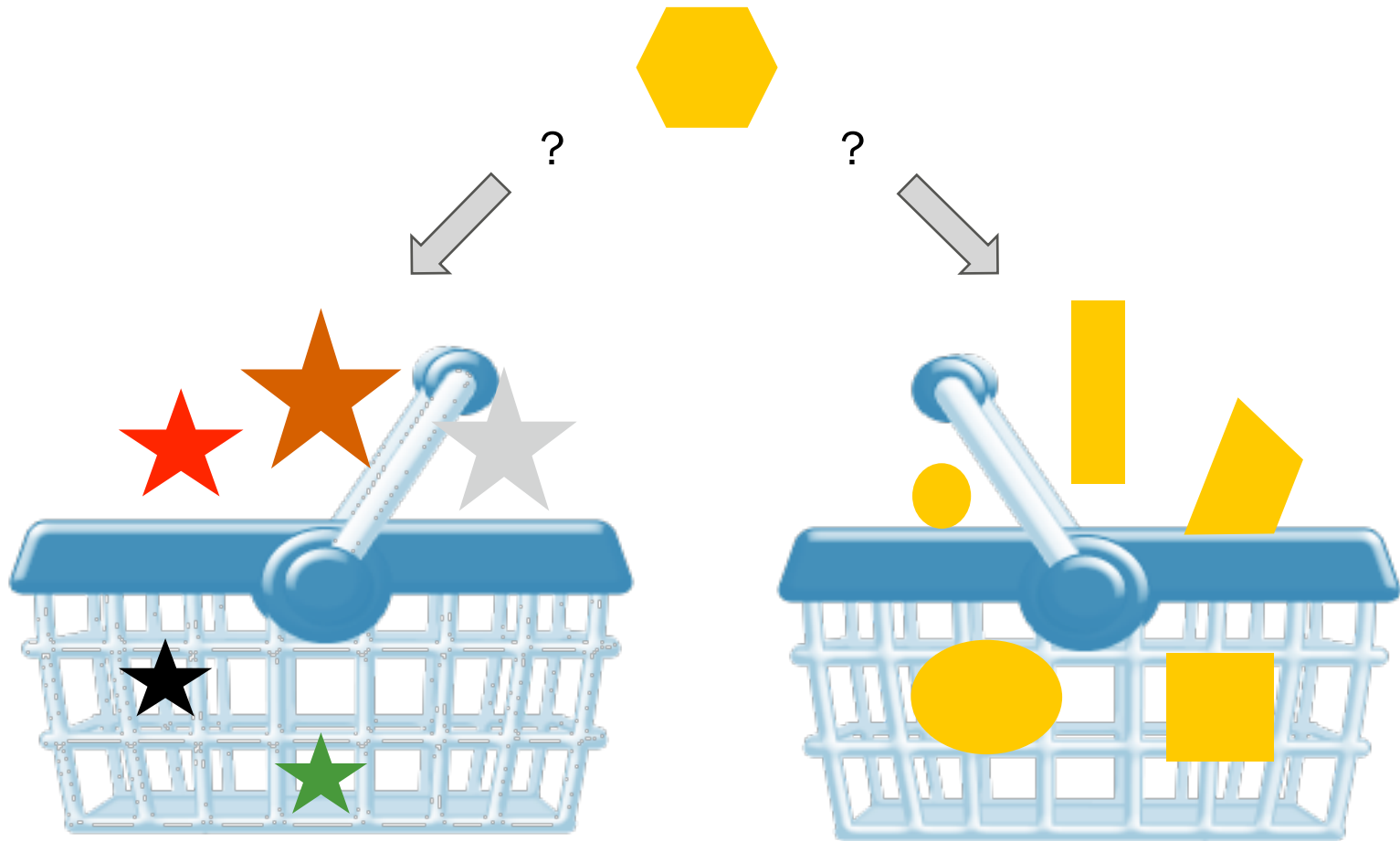
**Predictive
Analytics**



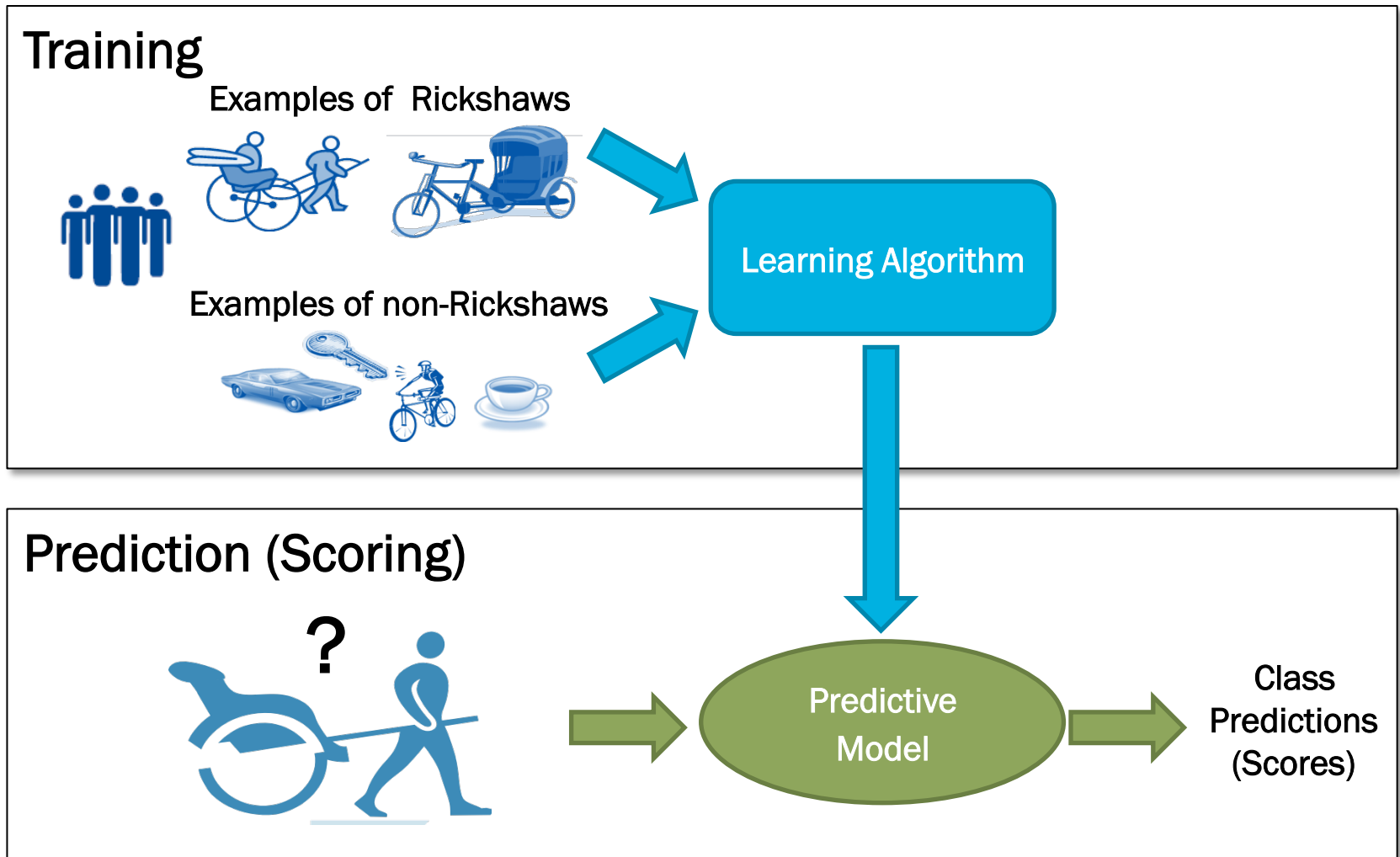
Data-Driven Prediction

Case Study

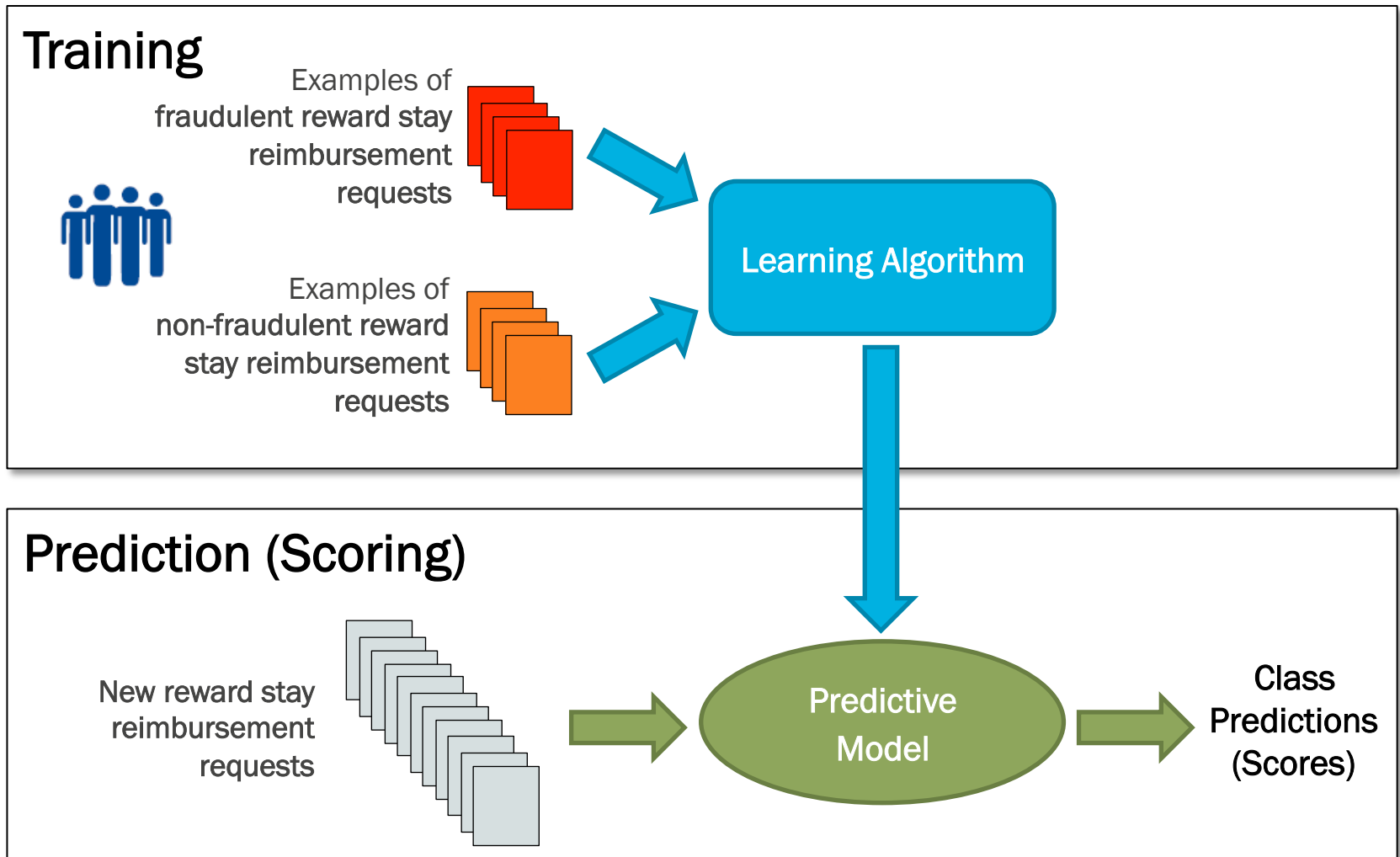
CAN YOU GUESS THE BASKET?



SUPERVISED LEARNING (PREDICTIVE MODELING)

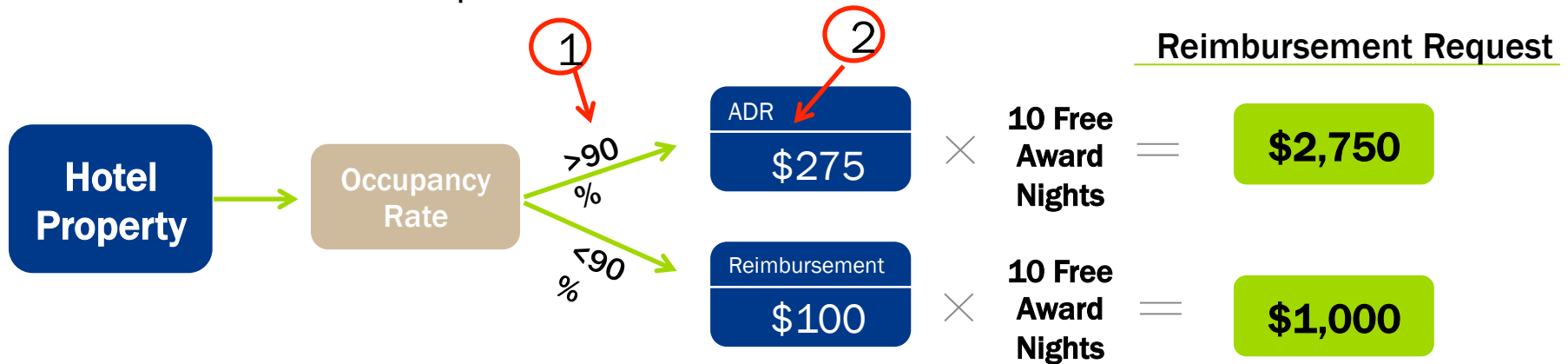


SUPERVISED LEARNING (PREDICTIVE MODELING)



PREDICTIVE MODELING CASE STUDY

Applying Predictive Modeling towards identifying fraud in Reward Stay Reimbursement Requests



① Occupancy Rate Inflation

② ADR Rate Inflation

Use of comp rooms, house use rooms and other techniques to manipulate occupancy rate above 90%

Manipulation of Average Daily Rate when occupancy rate exceeds 90% resulting in inflated reimbursement

PREDICTIVE MODELING CASE STUDY

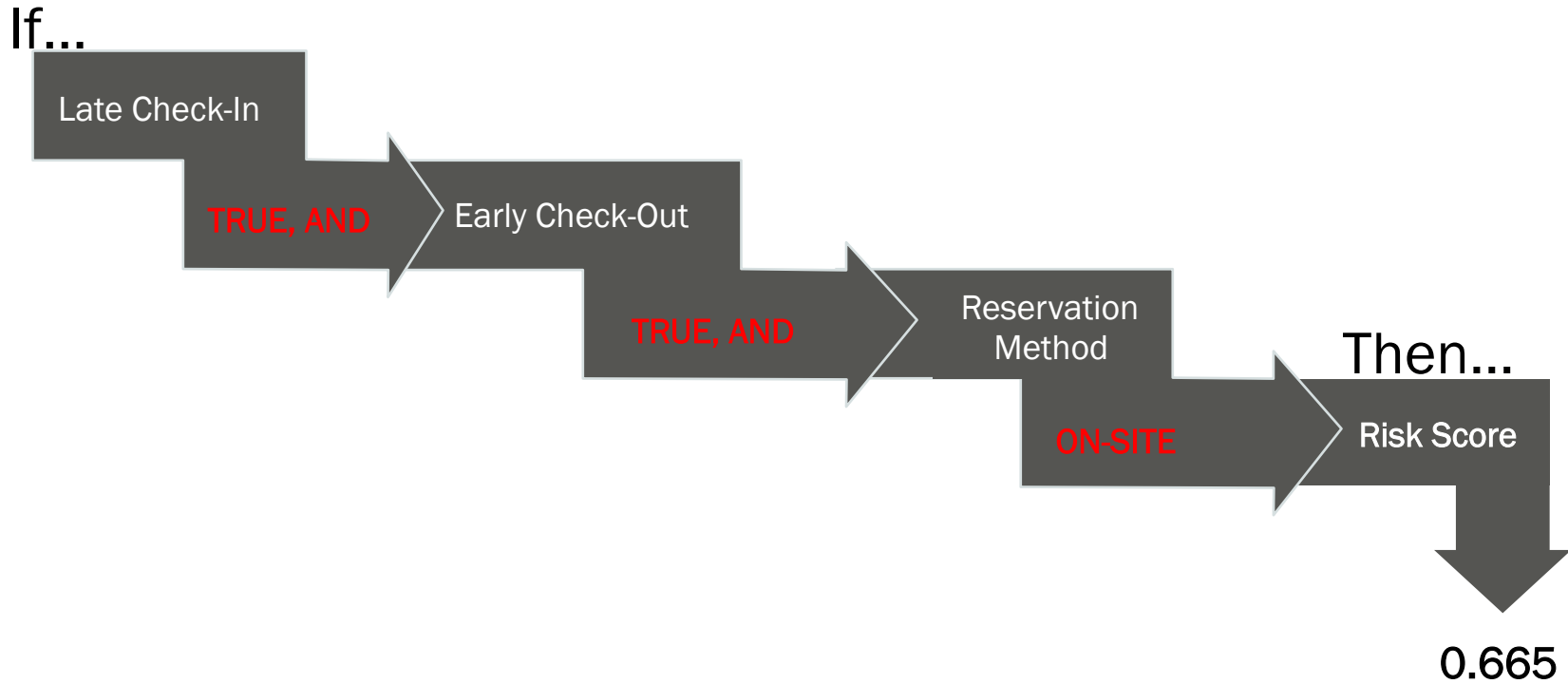
Reward Stay Attributes

- **Room rate**
- **Rate plan**
- **Amount of other charges to the room**
- **Total payment for a stay**
- **Payment method(s)**
- **Check-in time**
- **Check-out time**
- **The number of days for the stay**
- **The number of days before the stay a reservation was made**
- **Reservation method**
- **And many others...**



PREDICTIVE MODELING CASE STUDY

*Sample Fraud Detection Rule**



* For illustrative purposes only.

PREDICTIVE MODELING CASE STUDY

Comparison to random guess

Precision value based on Random Guess: 0.7%

Precision value based on Predictive Model: 70.8%

An increase of over 100 times!

PART III: BEHAVIORAL APPLICATIONS

Behavioral Applications



Stories vs. Spreadsheets

Bad Behaviors

TELLING STORIES WITH GAMECHANGER™



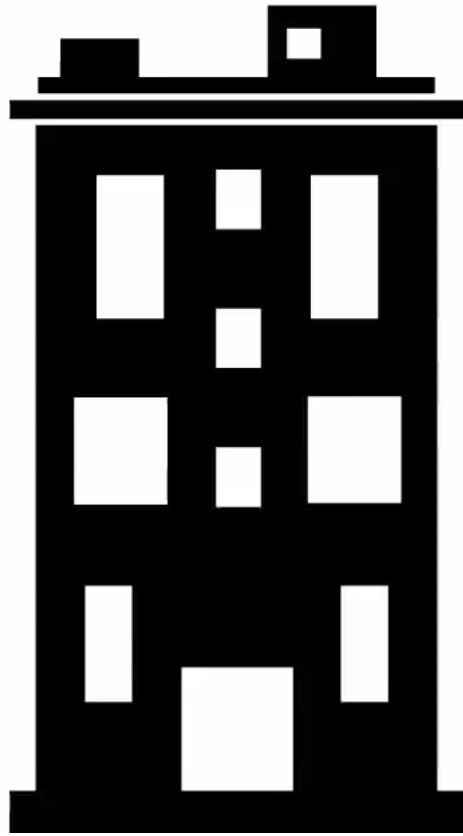
Friena fell 10-8 to Boys Ranch in five innings on Monday at Friena despite racking up seven hits and eight runs. Friena was led by a flawless day at the dish by Hunter Sundre, who went 2-2 against Boys Ranch pitching. Sundre singled in the third inning and tripled in the fourth inning ... Friena piled up the steals, swiping eight bags in all ...

“We help companies solve problems and generate revenue by leveraging highly structured data, turning it into actionable stories and insights.”

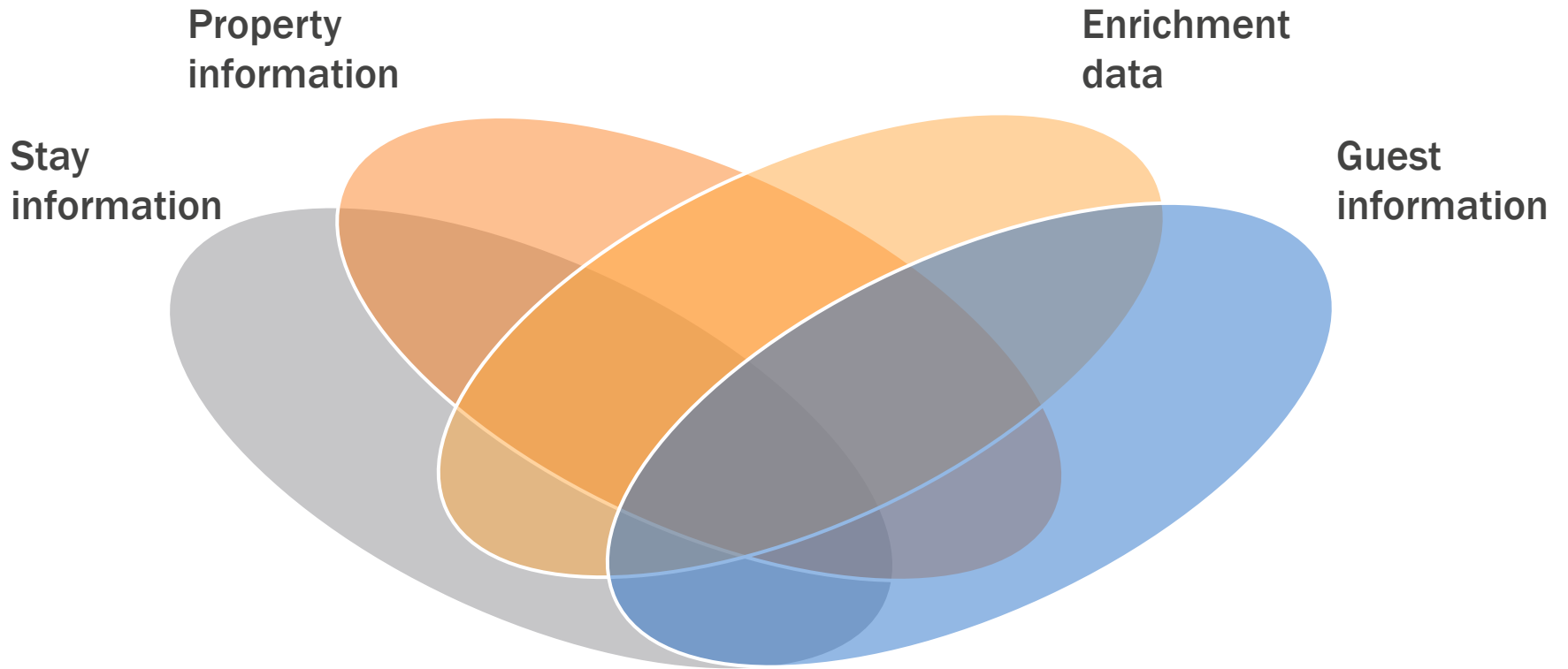
– Narrative Science



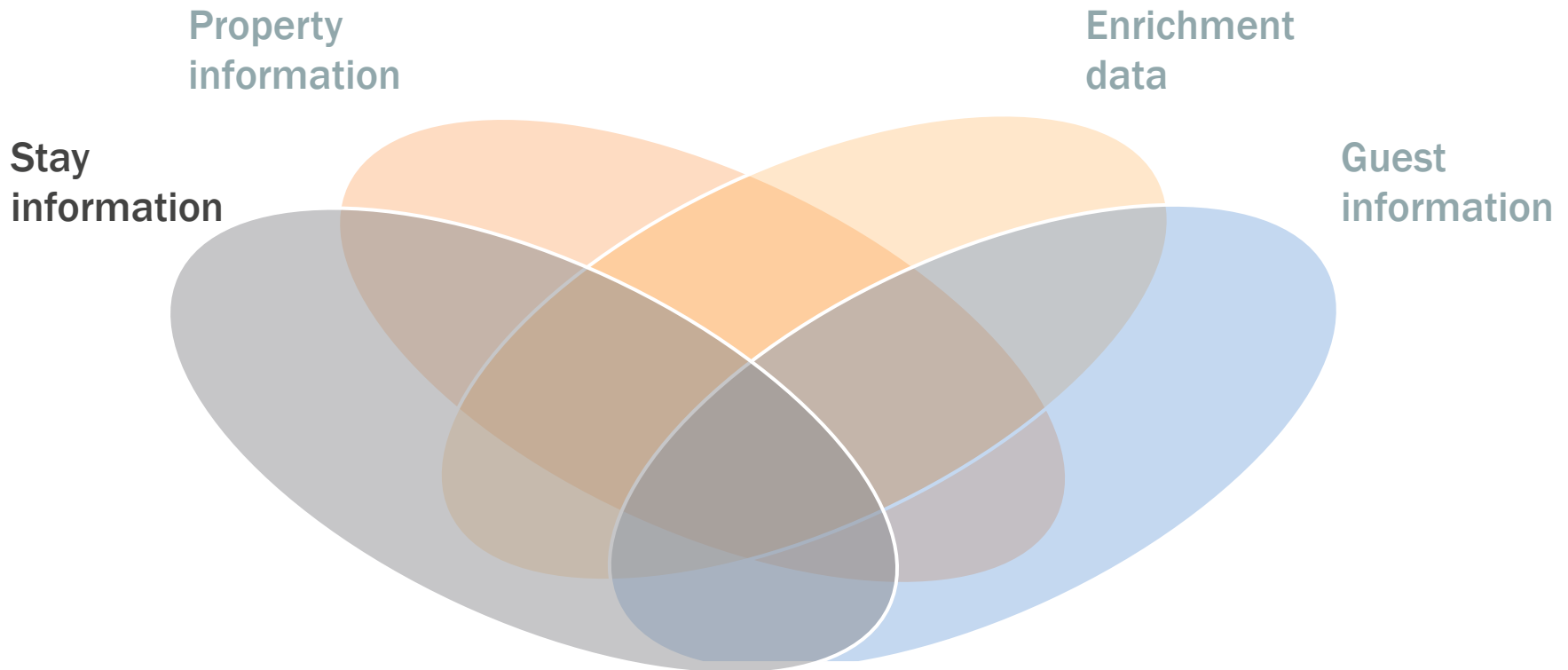
COMBATTING BAD BEHAVIORS



COMBATTING BAD BEHAVIORS



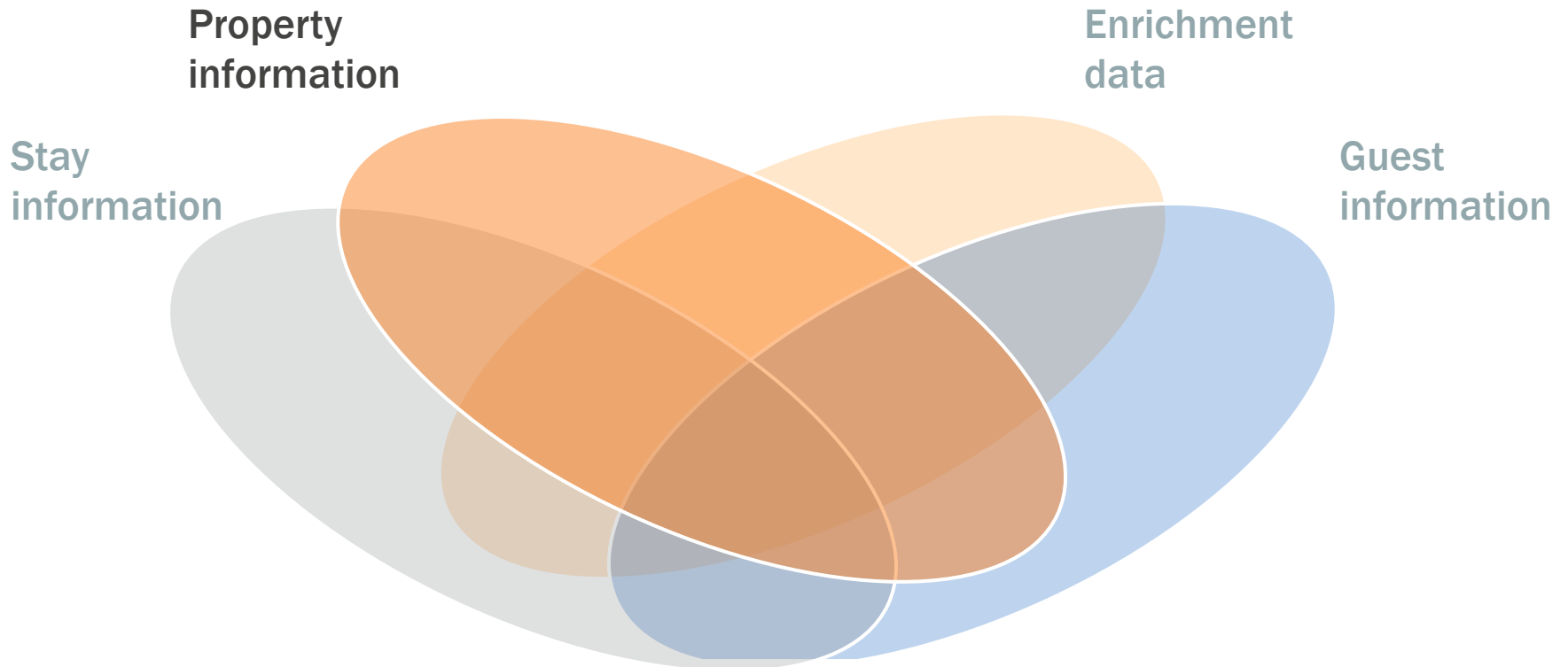
COMBATTING BAD BEHAVIORS



- Booking method (online, phone, in-person, agency)
- Payment method (credit card, cash)
- Check in/out times, duration
- Number of guests

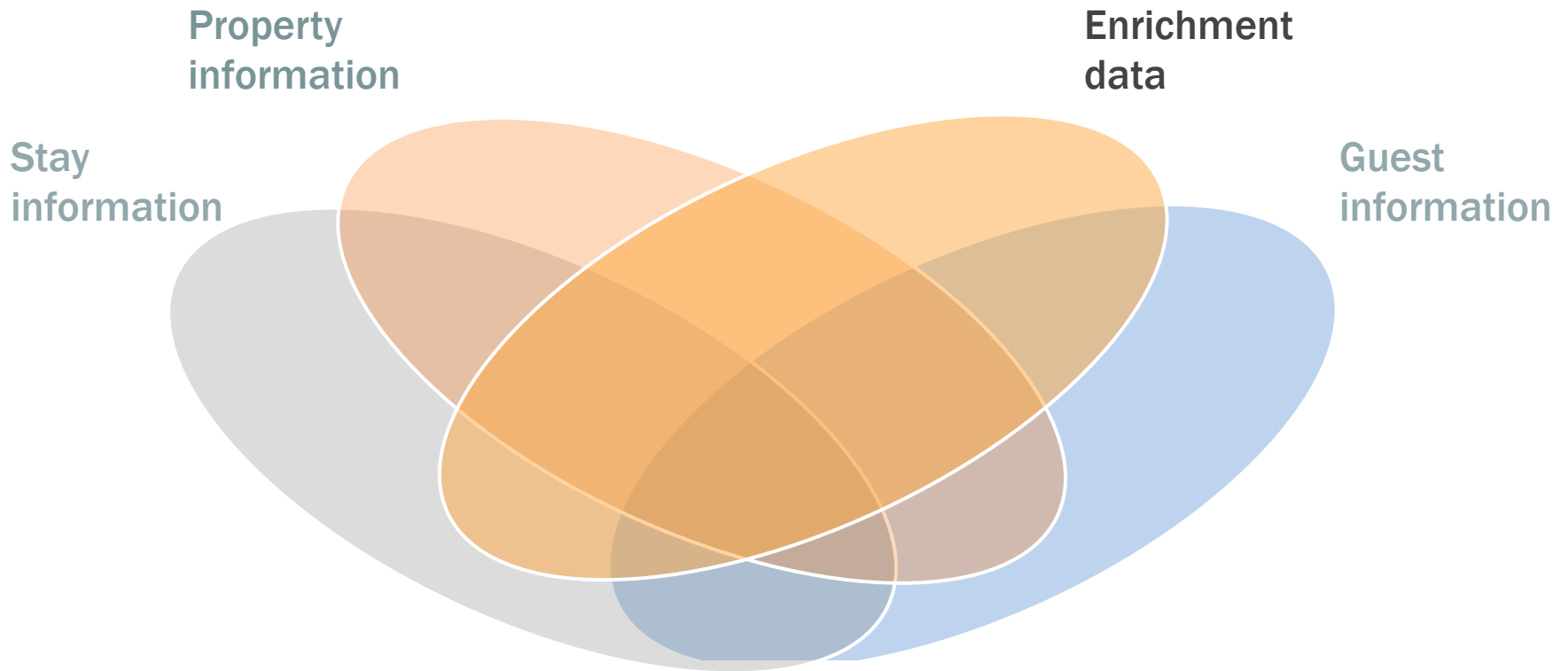
- Multiple stays, patterns
- Additional charges to room
- Electricity, phone, and Internet usage
- Room rate

COMBATTING BAD BEHAVIORS



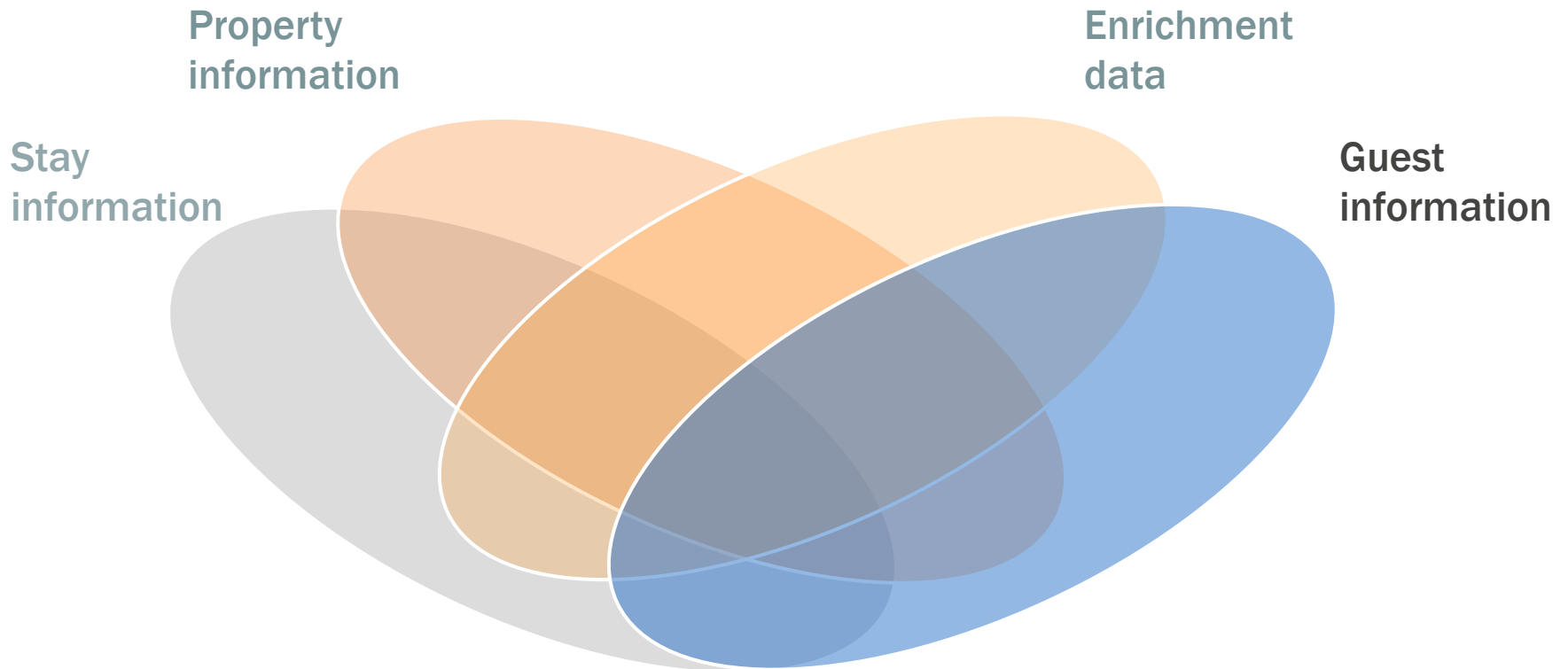
- Location
- Employee information
- Financial performance
- Utility usage
- Housekeeping/maintenance reports
- Paid/comped rooms, house use, out of order rooms
- Credit card fraud
- History of fraud, litigation and claims

COMBATTING BAD BEHAVIORS



- Property area demographics
- Area travel and driving route information
- Guest address validation
- Distance from guest address to property
- Area criminal activity
- Guest address area demographics
- Local do-not-rent lists
- Children

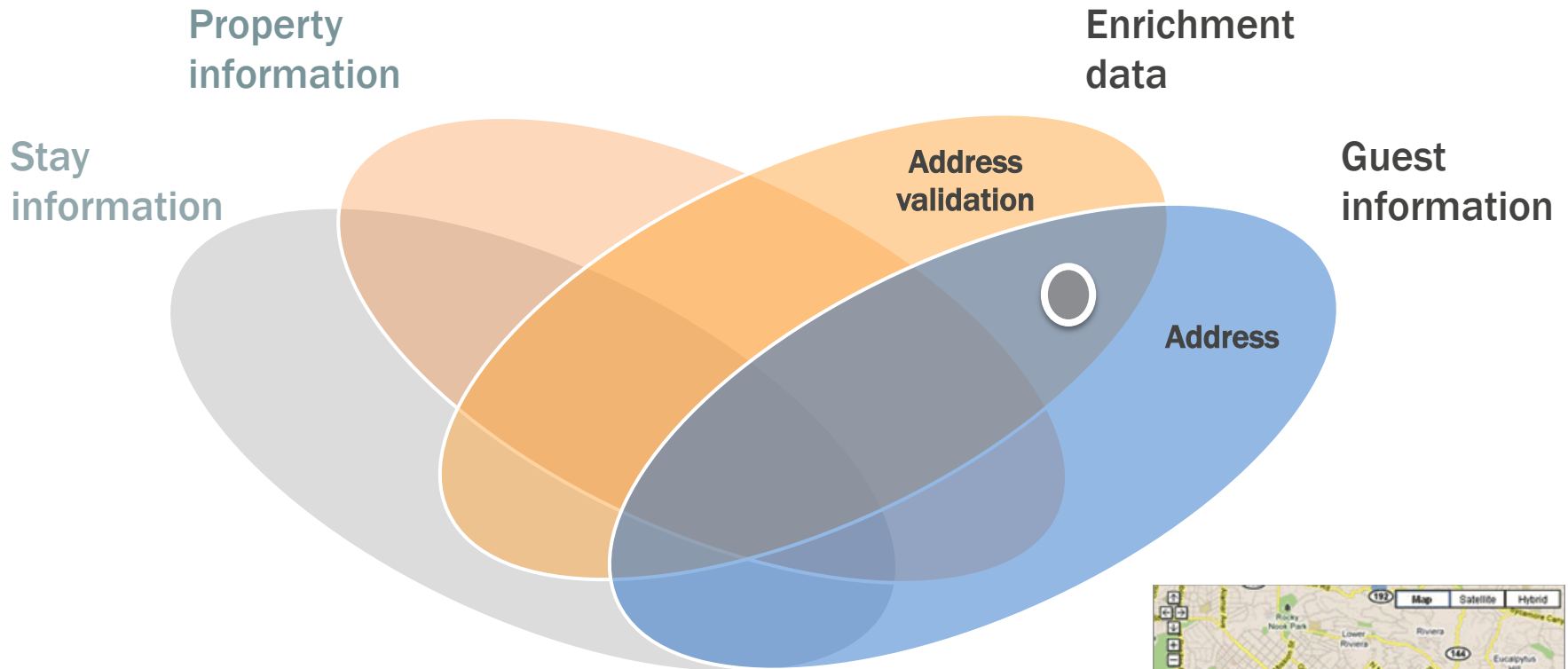
COMBATTING BAD BEHAVIORS



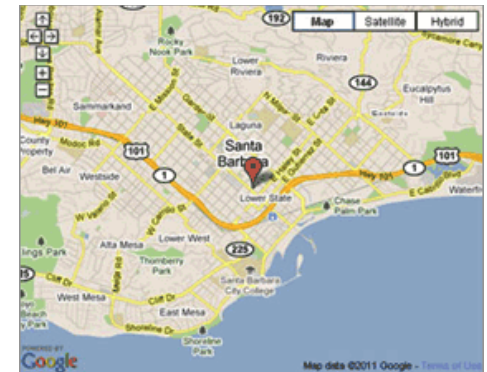
- Name
- Phone numbers
- Credit card numbers
- Addresses

- Email addresses
- License plate
- Loyalty program activity
- Social media activity

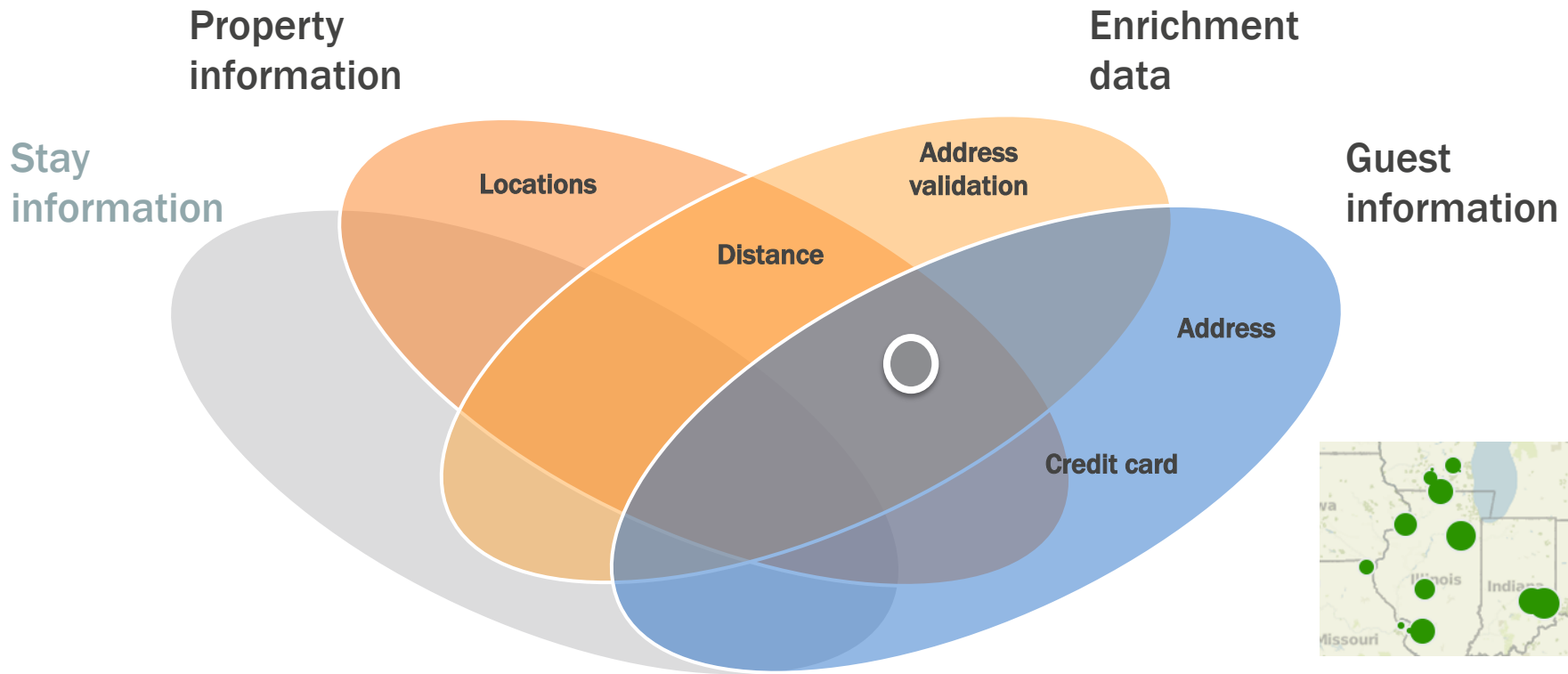
COMBATTING BAD BEHAVIORS



- Guests may provide fake addresses to avoid being identified if caught conducting illicit activities at a property.
- Conducting address validation may reveal a guest provided a non-existent address or one that maps to a non-residential location.

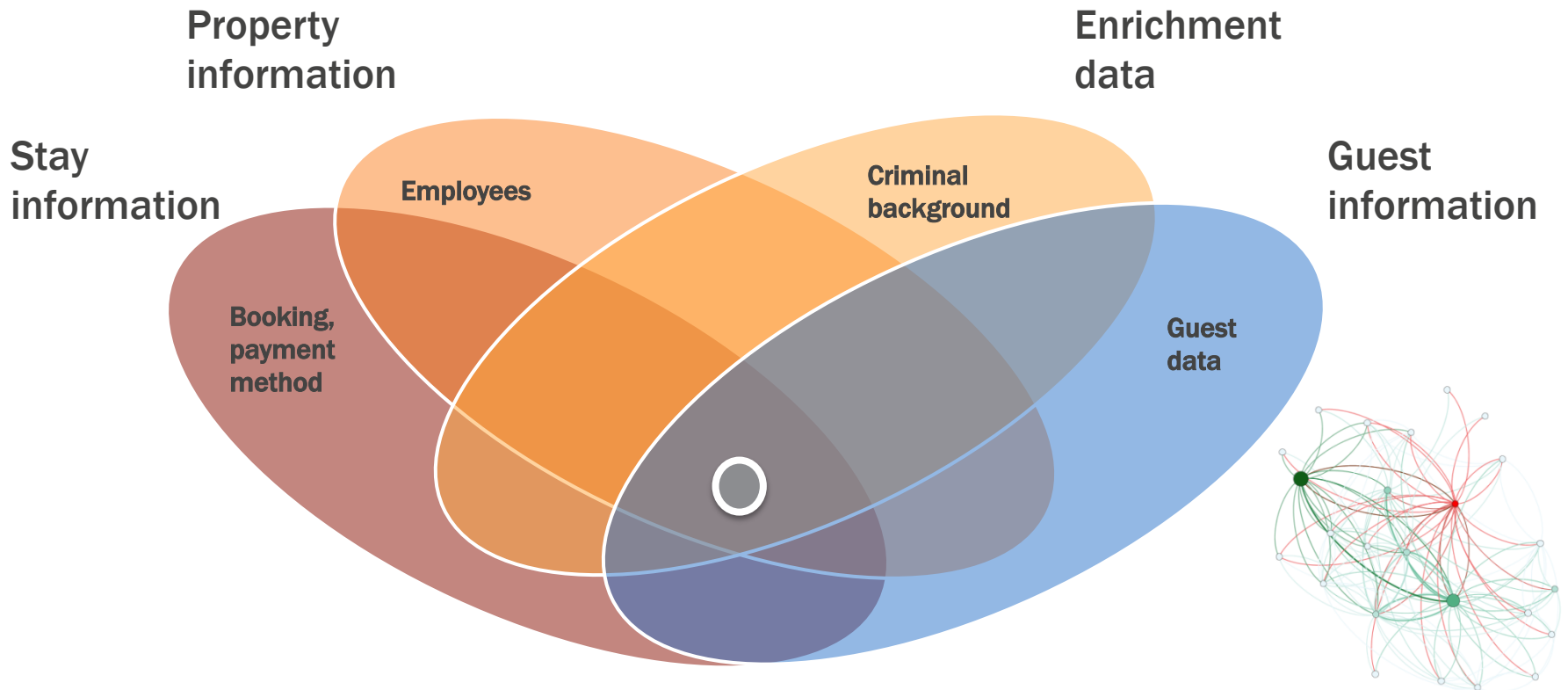


COMBATTING BAD BEHAVIORS



- Different guests **registering at multiple properties** using the same address, credit card or license plate may **indicate illicit activity** by several people using the same card.
- Matching guest information enriched with **third party sources** can help identify people who are engaging in this kind of activity.

COMBATTING BAD BEHAVIORS



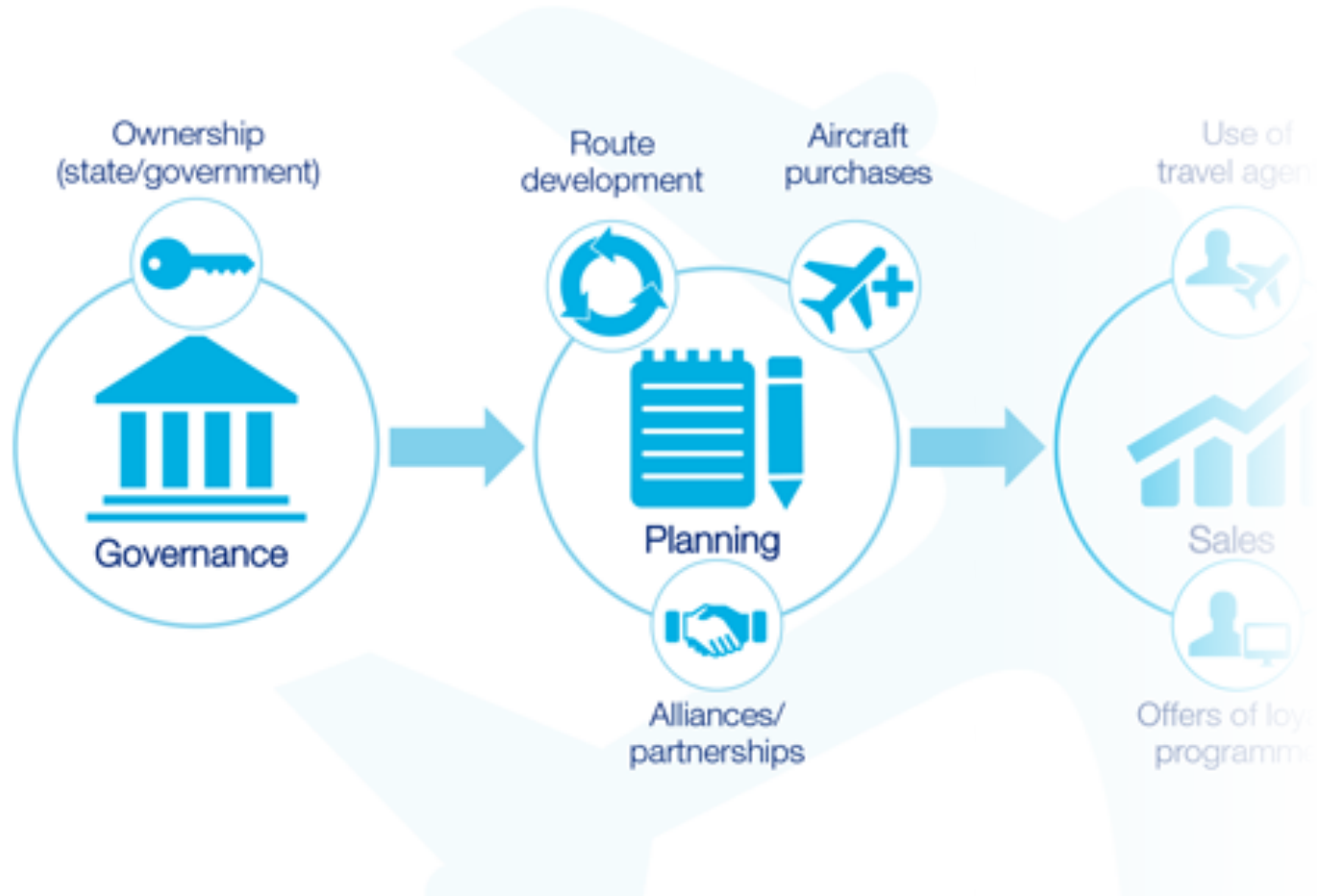
- Analyzing both employees and guests of properties with a history of illicit activity may reveal hidden relationships, such as familial or social connections, that permit such activity.
- Conducting a link analysis of data common to employees and guests – such as names, phone numbers or license plates – can help identify such unexpected relationships.

ONGOING MONITORING USING ANALYTICS



WHAT ARE THE CONCERNS?

Airlines



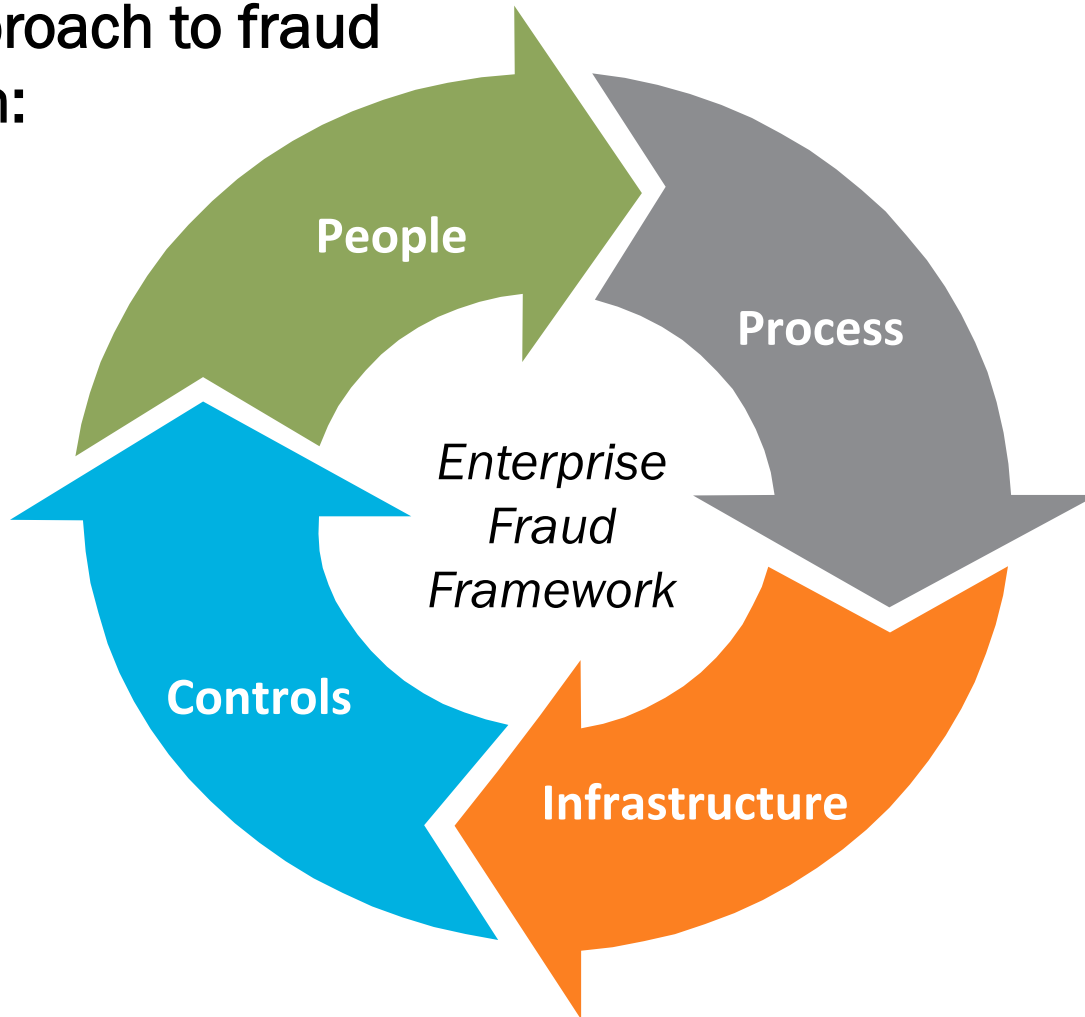
WHAT ARE THE CONCERNS?

Hotels



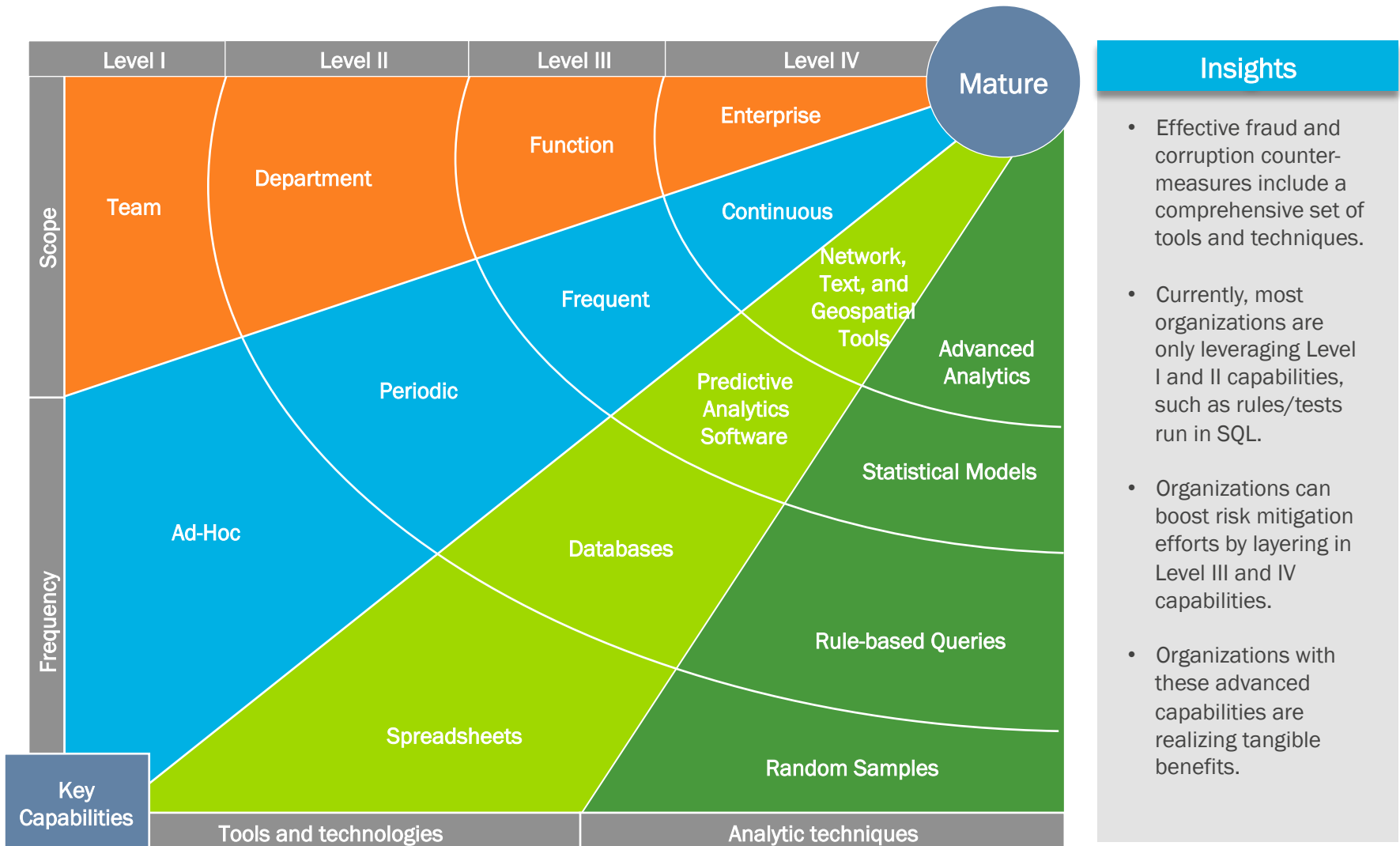
ENTERPRISE FRAUD MANAGEMENT (EFM)

A new approach to fraud prevention:



EFM LEVELS OF MATURITY

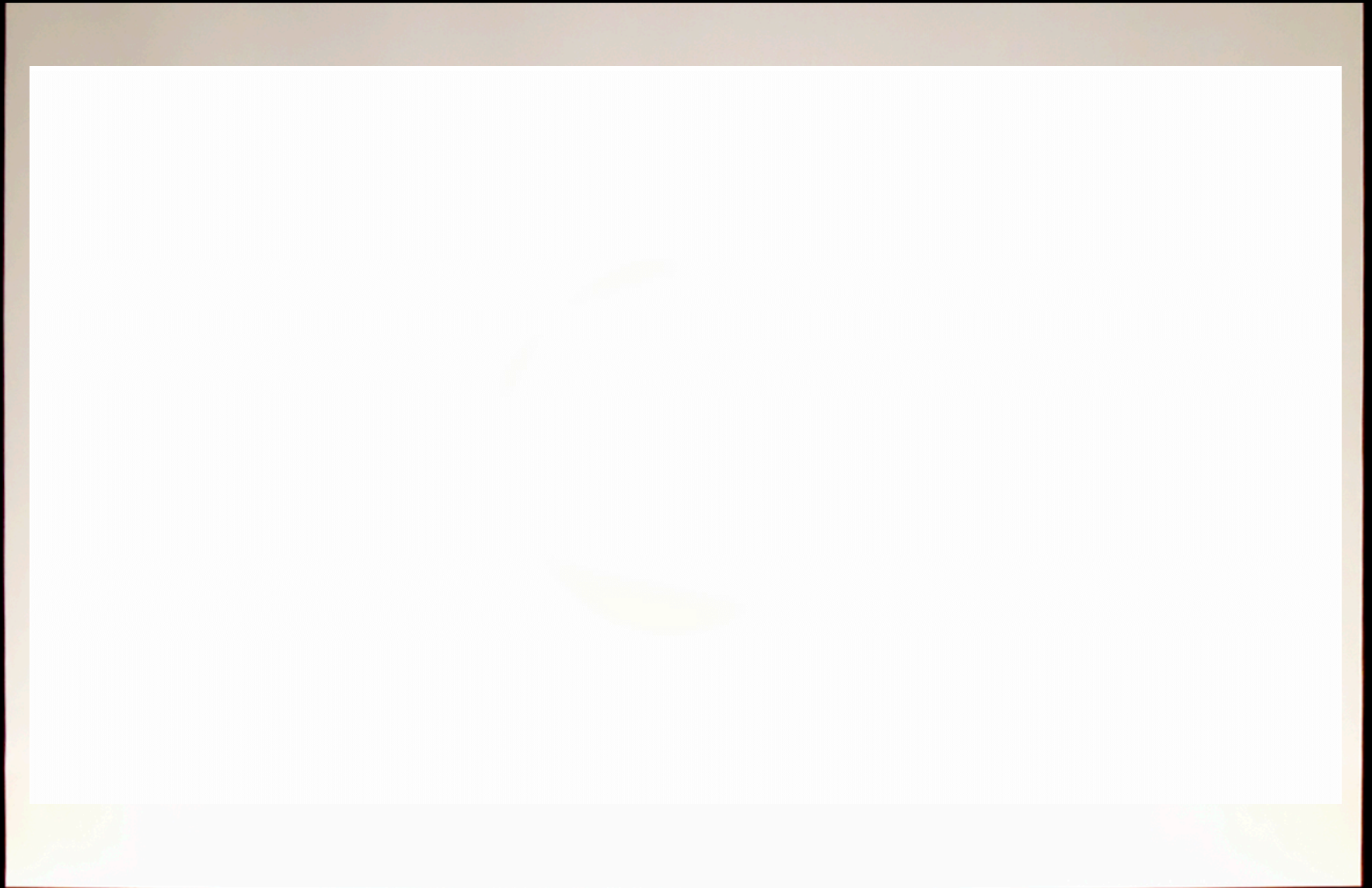
Multiple capabilities and a proactive posture are needed to mitigate bad behavior



PART IV: FINAL THOUGHTS

Final
Thoughts





PRESENTERS

Imran Hayat

MIR MICHELMAN & ROBINSON, LLP

Los Angeles | Orange County | Sacramento | San Francisco | New York

15760 Ventura Blvd., 5th Floor, Encino, CA 91436

T 818.783.5530 F 818.783.5507

E ihayat@mrlp.com www.mrlp.com

Deloitte.

Daniel S. Krittman

Principal
National Leader
Data Analytics

Deloitte Transactions and
Business Analytics LLP
1633 Broadway
New York, NY, 10019

Tel: +1 212 436 6712
dkrittman@deloitte.com
www.deloitte.com

Member of
Deloitte Touche Tohmatsu

Deloitte.

Anthony Campanelli
Partner

Deloitte Financial Advisory
Services LLP
1633 Broadway
New York, NY, 10019

Tel: +1 212 436 5386
acampanelli@deloitte.com
www.deloitte.com

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The background features three overlapping triangles: a large light blue triangle in the top-left, a teal triangle in the bottom-left, and an orange triangle in the bottom-right. The word "QUESTIONS?" is centered in the white space.

QUESTIONS?

Deloitte.



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