

# THE AUDIT ECOSYSTEM: INTEGRATING ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS IN THE AUDIT DOMAIN

Miklos A.  
Vasarhelyi

Rutgers  
University

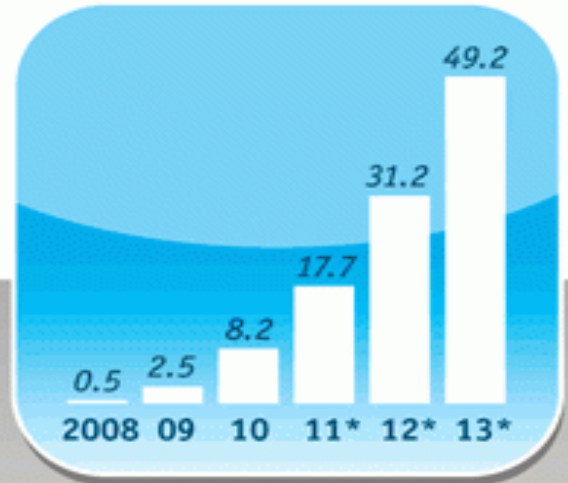
# ECOSYSTEMS (ECONOMIST)

- Pioneers such as Amazon have built cloud-based “ecosystems” that make content such as its electronic books widely available. Even though the firm has its own e-reader, the Kindle, and has hatched a tablet computer too, it has also created apps and other software that let people get at their digital stuff on all sorts of devices, including PCs.
- Other companies are developing their own ecosystems in a bid to make people’s mobile-computing experience even more seamless. Google’s recent \$12.5 billion acquisition of Motorola Mobility, which makes smartphones, tablets and other gadgets, will enable it to produce a new crop of devices to show off its cloud services, such as Gmail and Google Docs, to best effect.
- Apple is stepping up its integration efforts, rolling out an “iCloud” in which people can store up to 5GB of content for nothing, and more if they pay.

STORE	NO. OF APPS
Apple App Store	414,852
Android Market	237,199
GetJar	160,296
MobiHand	158,301
PocketGear	91,144
Mobango	82,936
Handango	44,685
SK Telecom T Store	37,629
BlackBerry App World	36,781
Handster	31,042

**Biggest app stores**

Q2 2011



**No. of app downloads**

Worldwide, bn

Games	64
Weather	60
Social networks	56
Maps/search	51
Music	44
News	39

**Most popular categories**

% of users<sup>†</sup>, Q2 2011

**Most popular:**

Apple	Android
1. Hair Plucker	1. Facebook
2. Temple Run	2. Google Maps
3. Draw 'n' Go: Awesomeness!	3. Talking Tom Cat 2
4. Office Zombie	4. YouTube
5. Google+	5. MP3 Music Download Pro

**Top free apps<sup>‡</sup>**

September 27th 2011

Sources: Android Market; AP; Apple; Gartner; Nielsen; research2guidance

\*Forecast <sup>†</sup>US <sup>‡</sup>Apple: iPhone only; Android: all devices

# A NEW WORLD IN ASSURANCE

- Companies are based on “big data” and respond often on a close to real time basis
- The financial cycles are now bipolar
  - Internal ERP based management data respond close to real-time, accounts like cash, A/R, A/P, and manufacturing are close to real-time
  - Statutory financial reporting is quarterly
    - while internal financial management is close to real-time to decrease occupation of capital

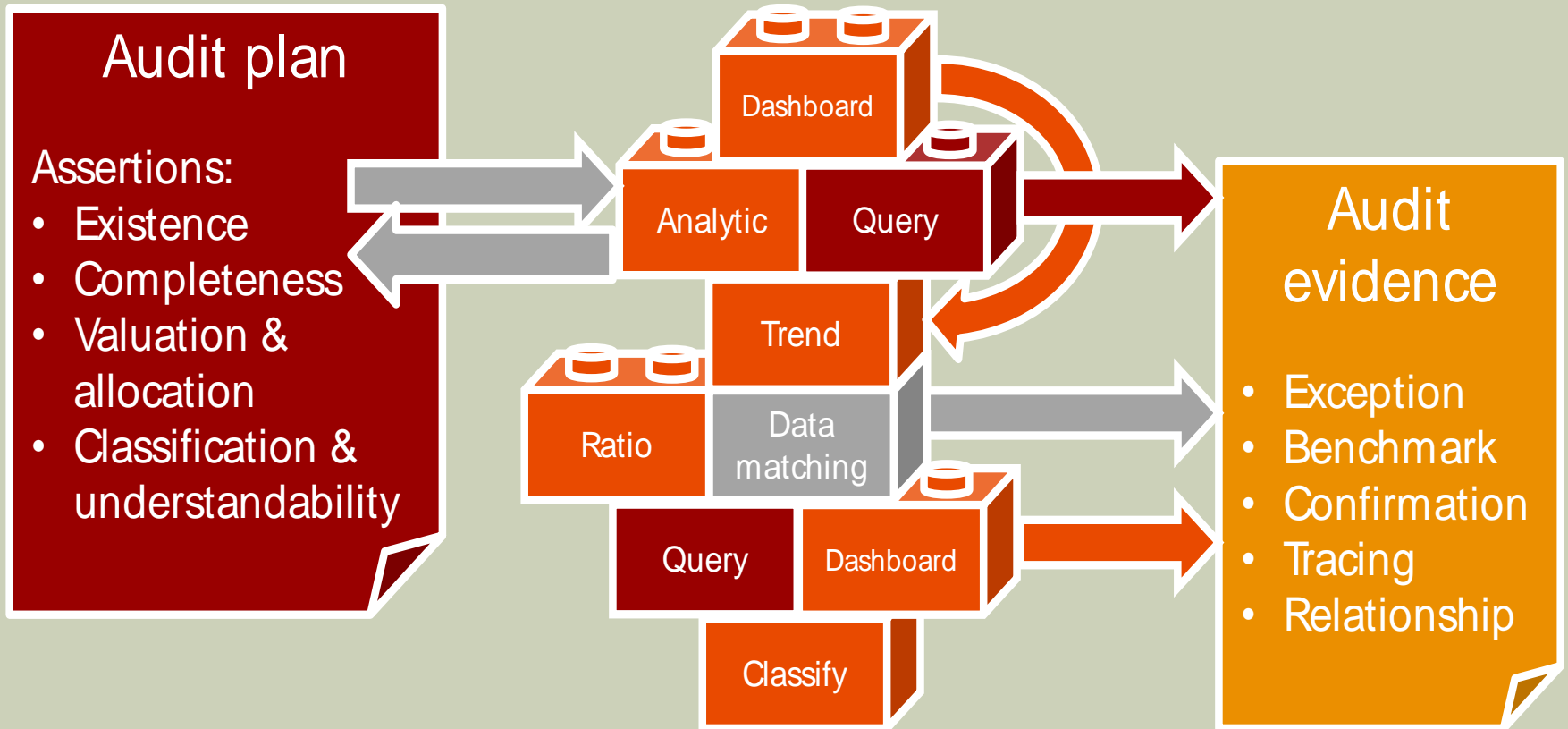
# CONTINUOUS AUDIT SYSTEMS

- The continuous audit will need to be a highly formalized system independent in the first and second harmonic of human reaction interference
  - These systems will be conceptually analogous to meta-controls and will force redefinition of audit independence, materiality and audit roles
  - They will be constructed in a hybrid mode with progressive automation of key elements

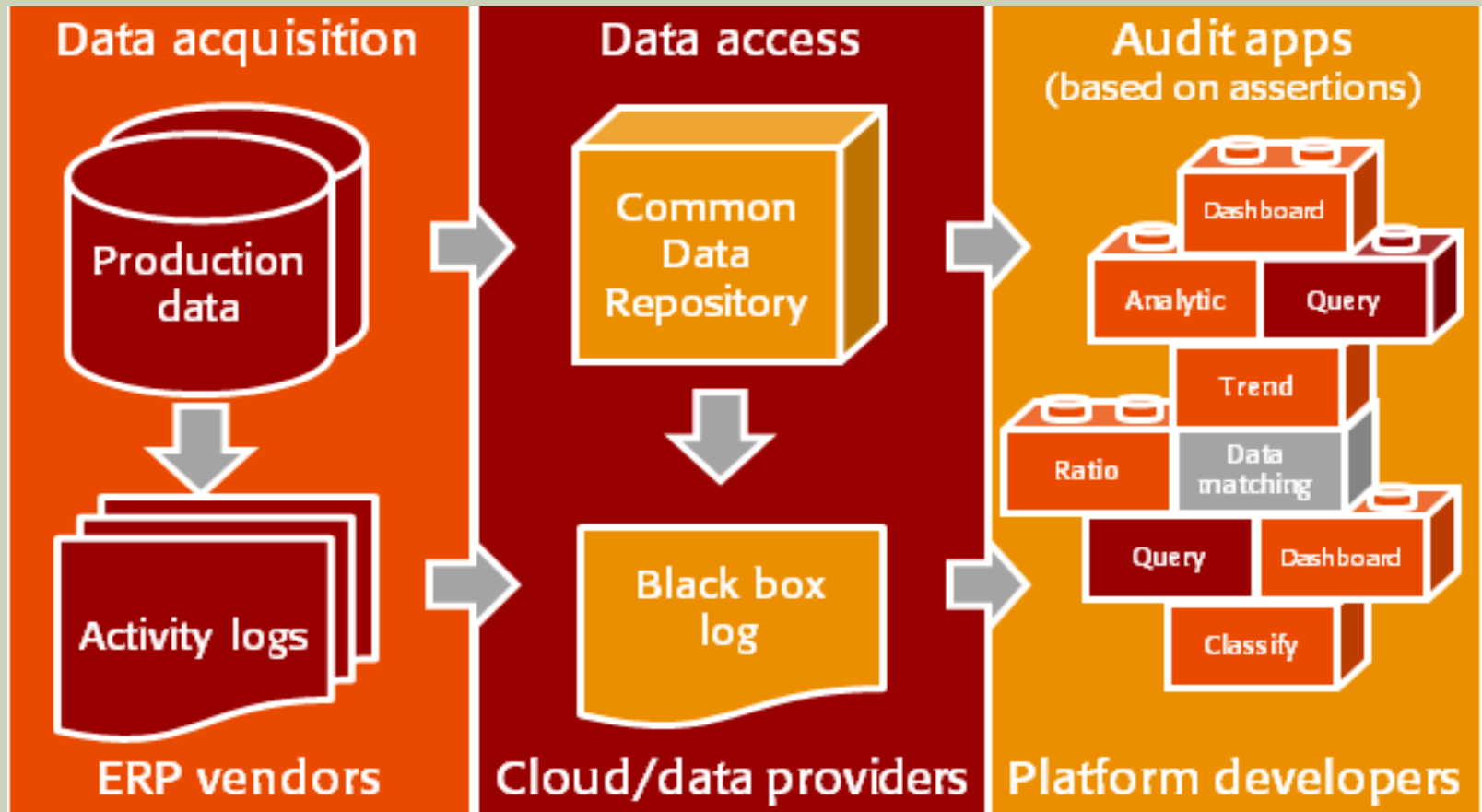
# THE NEW AUDIT ECOSYSTEM

- Embedded into corporate ERPs?
- Producing audit evidence and evaluating on a frequent basis?
- Cloud-based tapping information at all locations?
- Implementing audit heuristics at process levels?
  - Issues with knowledge capture
  - Issues with knowledge creation (how will experience be obtained / developed?)
- Delivering evidence on an alert basis with scores and frequent indicators
- Depending on much higher standardization than just ADS
- How will the profession (external) integrate into this scenario?

# A Progressive Automation Scenario

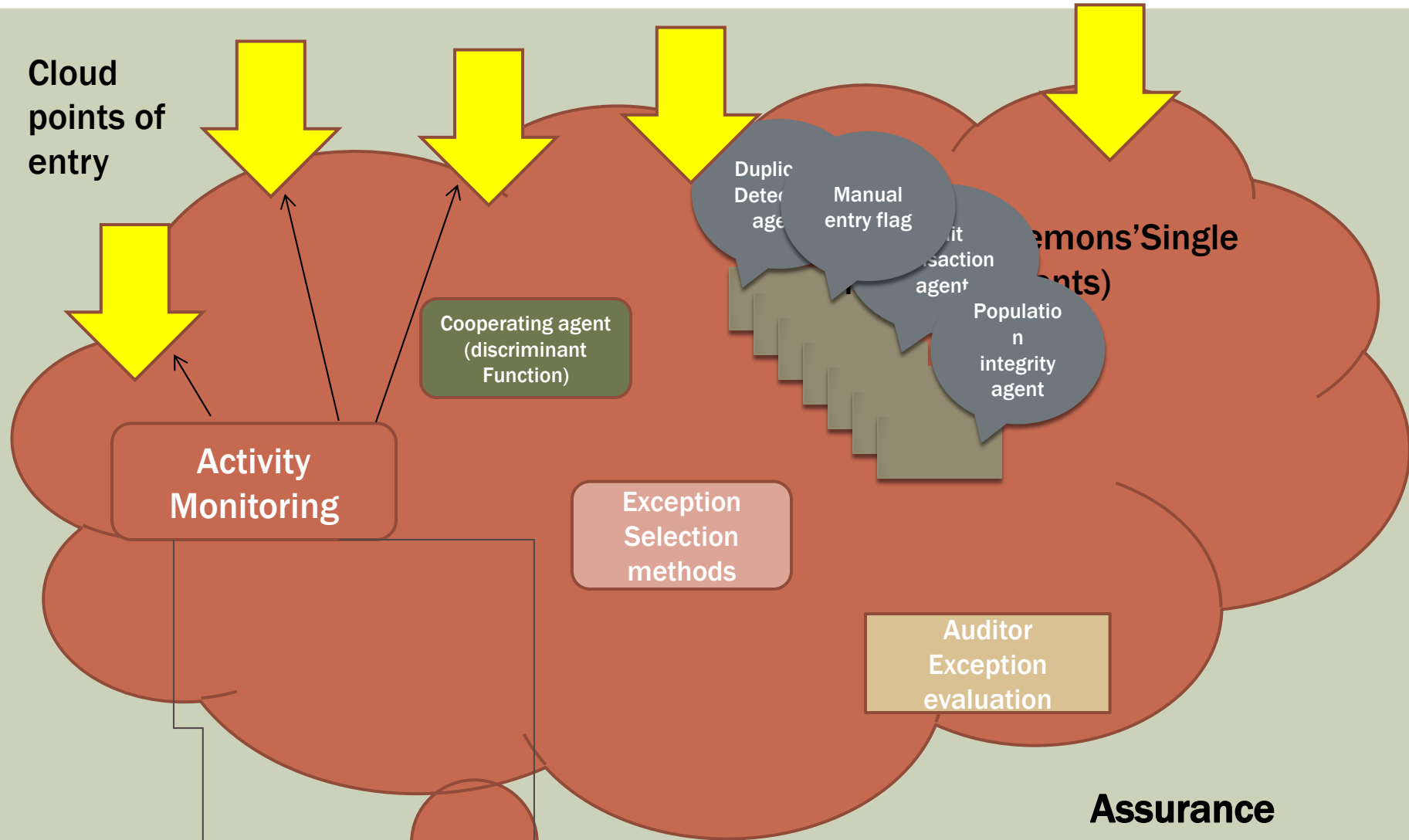


# The Audit Data Standard Architecture

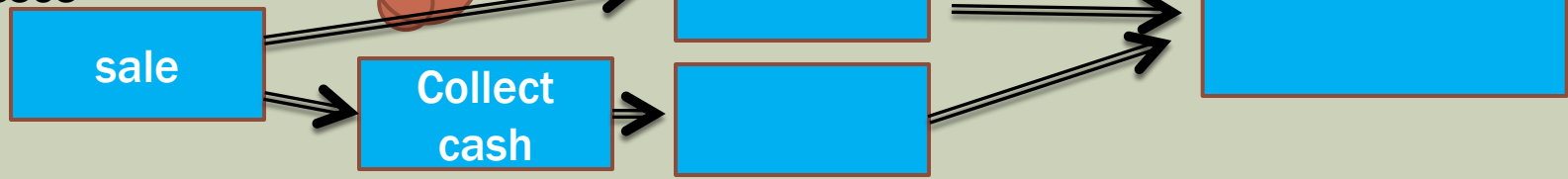




Cloud points of entry



Processes



Assurance Ecosystem

# CONCLUSIONS

- AI has had slow evolution and is still a science in early stages
- Expert systems were the leading AI application area but have lost its “independence”
- Case-based reasoning and neural networks are appropriate for specific domain problems
- Intelligent Agents will have an important role on the Internet
- They will fit into the audit ecosystem
- Some major quandaries exist in the evolving paradigm