

Innovative Appraisal Technology

Challenges, Trends and Opportunities

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 ICAP Appraisal Seminars
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Innovative Appraisal Technology

Today's Program

Learner Outcomes & Agenda

We'll discuss:

- History, status and trends in technology use in the appraisal profession
- Current opportunities (and challenges) provided by technology
- Drivers impacting collateral valuation (with some focus on rural markets)
- Apps and tools on the horizon that could benefit appraisers

Innovative Appraisal Technology

Introduction



Introduction

Industry Digitization?







Significant Differences

Sector	Over- app- raisal?	Assets				Usage				Labor				Em- ploy- ment share 2010-14	Produc- tion growth 2010-14	
		Digital enabled tools	Transac- tions	Proces- sing	Disinter- mediation	Mobile enabled	Cloud enabled	Work- force disrup- tion	Disrup- tion of supply chain	Disrup- tion of demand	Disrup- tion of proc- urement	Disrup- tion of logis- tics				
ICT														5	3	4.6
Media														2	1	3.6
Professional services														8	6	0.3
Finance and insurance														8	4	1.6
Wholesale trade														5	4	0.2
Advanced manufacturing														3	2	2.6
Oil and gas														2	0.1	2.8
Utilities														2	0.4	1.3
Chemicals and pharmaceuticals														2	1	1.8
Basic goods manufacturing														5	5	1.2
Mining														1	0.4	0.5
Real estate														5	1	2.3
Transportation and warehousing														3	3	1.4
Education														2	2	-0.5
Retail trade														5	11	-1.1
Entertainment and recreation														1	1	0.9
Personal and local services														6	11	0.5
Government														16	15	0.2
Health care														10	13	-0.1
Hospitality														4	8	-0.9
Construction														3	5	-1.4
Agriculture and hunting														1	1	-0.8

Introduction

Major Innovations by Decade

Increasingly Data/Analytics-Driven

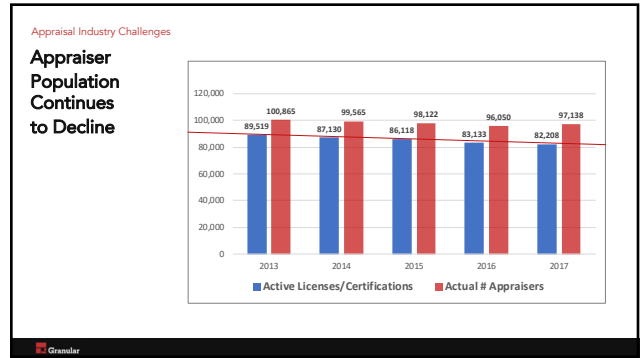
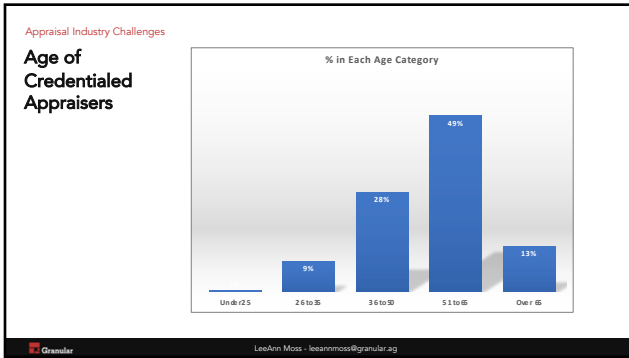







<1970s	1980s	1990s	2000s	2010s	2020s
Mainframe	PC	Internet	Mobile & Social Media	Big Data & AI	

Innovative Appraisal Technology

Appraisal Industry Challenges





Appraisal Industry Challenges

Primary Reasons We Don't Hire Trainees And What's the Alternative?

- Cost and time
- Concerns over professional liability
- Perceived record keeping burden
- Don't want to train a potential competitor
- We don't understand where they can best add value

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Appraisal Industry Challenges

Rural and Agricultural Appraisal Challenges

- Appraiser age
- Turnaround time
- Entry barriers
- Few trainees
- Regulation
- 80-20 rule

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Appraisal Industry Challenges

Rural and Agricultural Appraisal Illinois – What Type of License?

State Certified General – Appraisal of all types of properties without restrictions as to scope of practice.

State Certified Residential - Appraisal of one to 4 unit residential real property without regard to transaction value or complexity

Restrictions as to the scope of practice in an FRT in accordance with Title XI, provisions of USPAP, AQB criteria, and further defined by rule.

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Appraisal Industry Challenges

Industry Needs Can Technology Help?

- Real time data
- Data that can be trusted
- Document/data digitization
- Transparency
- Operational efficiency (productivity)
- Integration with others
- Speed
- Marketing

Big Data

- Artificial Intelligence
- Machine Learning
- Deep Learning



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Appraisal Industry Challenges

Applying USPAP Credibility

- **Credible** – Worthy of belief
- **Comment:** Credible assignment results require support, by relevant evidence and logic, to the degree necessary for the intended use.

Source: 2018-19 USPAP, The Appraisal Standards Board






Appraisal Industry Challenges

Applying USPAP Scope of Work Acceptability

- The scope of work must include the research and analyses that are necessary to develop credible assignment results.
- **Comment:** The scope of work is acceptable when it meets or exceeds:
 - The expectations of parties who are regularly intended users for similar assignments, **and**
 - What an appraiser's peers' actions would be in performing the same or a similar assignment.

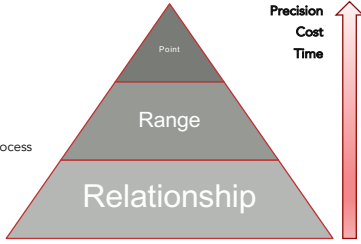

Source: 2018-19 USPAP, The Appraisal Standards Board

Appraisal Industry Challenges

Applying USPAP Reporting Value



- Traditional training?
- Traditional techniques?
- Proliferation of reviewers?
- Typical consumer?
- Typical problem identification process doesn't even consider matching

Appraisal Industry Challenges

Which Valuation Method? It's Not One Size Fits All

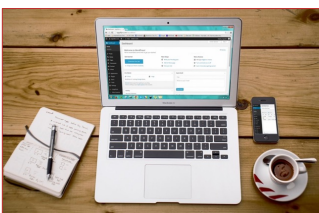

- Is the cost of the valuation commensurate with the value of the information (e.g., in the underwriting process)?
- Does the choice reflect a responsible level of valuation risk management?
 - Riskier borrow → More valuation rigor
 - Great credit standing → Wider aperture in property value
- Appraisal management by loan size bracket – is the risk proportional to the workload?
- Origination (higher perceived risk) vs. subsequent transaction (lower risk)?
 - Point estimate, or range or relationship?

Appraisal Industry Challenges

Will the Appraisal Industry Survive? That's Not the Question

- What tools will we use?
- How will we present our results?
- What type of assignments will we do?

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Technology That Matters

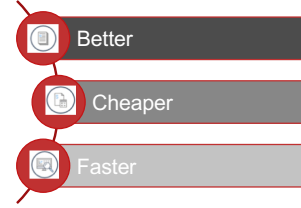



The Appraisal Process Technology, Human Intelligence or Both?

- 1. **PROBLEM IDENTIFICATION** Client, Intended Users, Value Type, Effective Date, Relevant Characteristics, Assignment Conditions (EA, HC)
- 2. **SCOPE OF WORK DETERMINATION** Amount & type of info researched, analysis applied
- 3. **DATA COLLECTION & PROPERTY DESC.** Market area, subject property, & comparable property data
- 4. **DATA ANALYSIS** Market analysis, Highest & Best Use analysis
- 5. **SITE VALUE OPINION**
- 6. **APPLICATION OF THE APPROACHES TO VALUE** Cost, Sales Comparison, Income Capitalization
- 7. **RECONCILIATION & FINAL OPINION OF VALUE**
- 8. **REPORT OF DEFINED VALUE**

Technology Use What's the Value?

- Make informed/better decisions
- Find and prevent errors
- Save time
- Save labor costs
- Provide information
- Analyze data



Drones A Few Applications

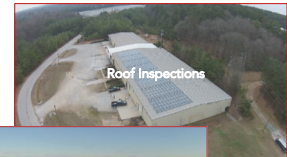
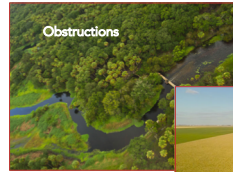
- Fighting pirates, poachers & unemployment
- Monitoring climate, wildfires, tornados & endangered wildlife
- Aerial photography
- Archeology & antiquities
- Saving lives in combat zones
- Democratizing the internet



- Finding anything from parking places to stranded hikers
- Product delivery
- Robotics research
- Media & movie applications
- Even Martha Stewart does
- Precision ag (80%)

Adapted from Popular Science, August 2014 Issue

Drones Appraisal Applications



Mobile Inspection Apps Records On the Go

- Capture a record of inspection
- Photographs
- Notetaking – Type or voice
- Captions, location, direction, etc.
- Sync to web
- Timeline



Ample Land Intelligence Data Aggregated and Searchable

- Mapping
- Parcel data
- Ownership info
- "Virtual plat book"
- FSA tillable acres
- Soil maps & yields
- Land use
- Crop history
- Sold land
- Land for sale
- Land value info
- Land value trends
- Climate information
- Livestock demand
- Topography maps
- Flood zones
- Basis
- County averages
- Mobile
- Etc.




Technology that Matters

Ample Land Intelligence Data

Aggregated and Searchable

Search and identify parcels, sales or listings by

- Soil productivity
- Location
- Acreage
- Date
- % tillable
- Crop(s) grown
- Land use
- Ownership
- Etc.



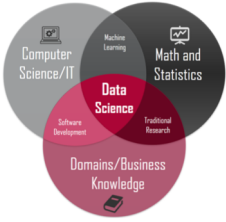
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Technology that Matters

Data Science

It's Changing the Conversation

- An interdisciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from data in various forms, both structured and unstructured.




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Technology that Matters

Artificial Intelligence

It's Game Changing

- **Artificial Intelligence** is the theory and development of computer systems able to perform tasks that normally require human intelligence (e.g., visual perception, speech recognition, decision-making, and translation between languages).
- **Machine learning** uses algorithms to parse data, learn from that data, and make informed decisions based on what it has learned.
- **Deep learning** structures algorithms in layers to create an "artificial neural network" that can learn and make intelligent decisions on its own. It's what powers the most human-like artificial intelligence.

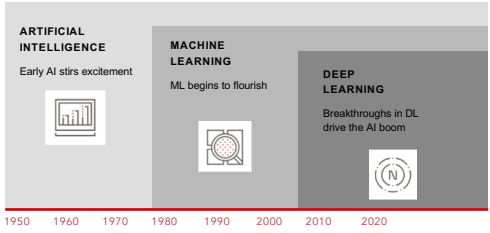


Dictionary.com

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Technology that Matters

Evolution and Relationships




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Technology that Matters

Artificial Intelligence

Real Property & Appraisal Applications

- Residential real estate platforms that match home buyers with agents
 - E.g. HomeLight
- Chat bots that will correct your work
- Bots that will take you through the appraisal process
 - Reporting
 - USPAP
 - IAG

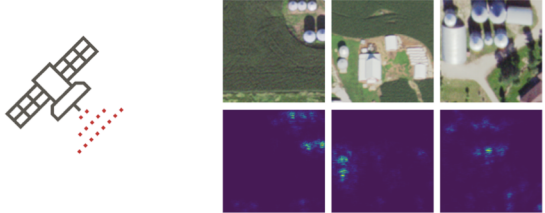


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Technology that Matters

Artificial Intelligence

A Deeper Dive into Deep Learning



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Artificial Intelligence Real Property & Appraisal Applications

- Identification properties by type from imagery
 - # rooms or SF
 - Pool
 - Garage size
 - When constructed
 - Etc.
- Compare sales to subject and identify sales to chose from
- AVMs



Automated Valuation Models AVMs

- Computer software program that uses an automated process to analyze market, demographic, economic and property etc. data to estimate a property's value
 - Regression, adaptive estimation, artificial intelligence (e.g., neural networks), etc.
- Examples – Zillow, House Canary, Veros, AcreValue, etc.
- Use examples
 - Mortgage prequalification
 - Home equity lines of credit
 - Refinancing, loan modifications
 - Portfolio and valuation risk monitoring
 - Appraisal quality management (review)
 - Account management

Contributors to Farmland Value What Could be Included in an AVM?

- | | | |
|---|---|---|
| Macroeconomic <ul style="list-style-type: none"> • Interest rates • Economic policy • Trade policy • Farm policy • Commodity prices • Etc. | Parcel-Specific <ul style="list-style-type: none"> • Soil types • Water/drainage • Weather patterns • Minerals • Topography • Access • Location • Etc. | Parcel-Specific (can control) <ul style="list-style-type: none"> • Drainage/water • Conservation work • Fertility • Farm operator • Condition, maintenance • Utility • Etc. |
|---|---|---|

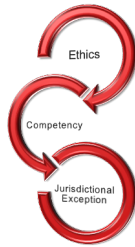
Automated Valuation Models When Not to Use Them



- Market conditions suggest it's not a good idea
 - Significant economic event
 - Natural disaster, etc.
- Subject property is atypical or unique
- Model performance is outside of intended user tolerances
 - Geographic area
 - Price tier range, etc.

USPAP AO-18 Use of an Automated Valuation Model

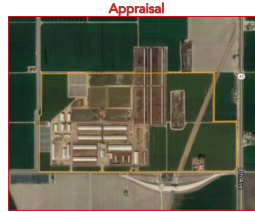
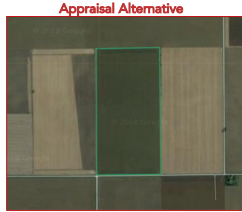
- AVM output is not, by itself, an appraisal.
- Communication of output is not, in itself, an appraisal report.
- Output can be the basis for an appraisal/review if appraiser believes it is credible for the specific market and assignment.
- If asked to comment on whether output is credible for a specific property given the intended use, this is appraisal practice
 - Comply with 3 of the "Big Rules"
 - No performance standards
- Buttress/support for a reported value opinion?



Which Valuation Method? It's Not One Size Fits All

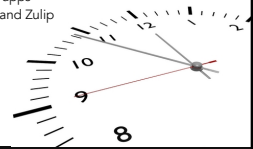


Which Valuation Method? It's Not One Size Fits All



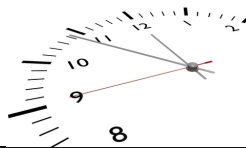
Additional Tools Apps etc.

- Cloud based file storage and synchronization services
 - DropBox, One Drive, Google Drive
- Integrated mapping
- Real time team messaging, collaboration and file sharing apps
 - Slack, free open source alternatives like Rocket.Chat and Zulip
 - Searchable
- Speech recognition software (e.g., Dragon)



Additional Tools Apps etc.

- Quick voice messaging (e.g., Voxel)
- Crowdsourced traffic app (e.g., Waze)
- Cloud based video and audio communications/conferencing (e.g., Zoom, GoToMeeting, Webex)
- Expense app (e.g., Tallie, Rydoo)
- Building sketch software (e.g., Apex Sketch)
- Cloud based reporting software
 - Innovation or mis-innovation?



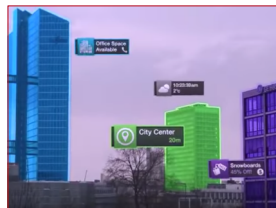
Geospatial and Economic Data Realtors Property Resource

- National property database (166 million)
- Search, analyze, map
- Robust search features
- NAR members or affiliates only
- School reports, demographics, census, tax info, foreclosures, listings, sales data, mortgage info, mapping, distress, flood zones, traffic counts, historic, AVM widget, tenant data (commercial), investment analysis, listings, distressed properties, mobile comp analysis (on-the-go CMA on your phone), trade area info, heat maps, customer segmentation.



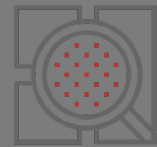
Augmented Reality Browsing the Real World

- Is it digital reality?
- Digital and virtual data/information overlay
- Fighter jets, cars, marketing, travel, instruction manuals, "does it fit?"
- Think heads up display in Iron Man
- Measurement by photo



Appraisal Industry Opportunities & the Role of Tech

Concluding Comments



Concluding Comments

For Real Property Professionals Winners and Losers?

"The person sitting around the table with the best information, data, and tools wins."



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Concluding Comments

New Industry Paradigm Needed? And Technology Will be Critical

- **Machines will not replace humans**
- There is no "one size fits all" valuation product
- Specialization → Team appraisal
- Reasonable regulation
- Innovative training and education
- USPAP is flexible, provides guidance
- Appraisers → Non-USPAP compliant Evals?



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Concluding Comments

New Appraiser Thinking Needed? And Technology Can Help

- **Machines will not replace humans**
- Appraiser as "valuation specialist"
- Increased efficiency
- More complex assignments
 - Higher competency work
 - Micro-market competence
 - Human intelligence
- Diversification



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Thank you

Questions?

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AcreValue

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