International Collaboration Project – Business Process Modernisation

IPTI White Paper – February 2026

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About the International Property Tax Institute (IPTI)

The International Property Tax Institute (IPTI) is widely recognized as the world's leading organization on property tax policy and practice.

IPTI's mission is to provide impartial, objective expert advice in the area of property tax systems and promote the concept that these systems should be fair and equitable and meet the needs of all stakeholders, i.e. governments, taxpayers, practitioners and academics. In addition, IPTI seeks to ensure that property tax systems contribute to the provision of high-quality services for the benefit of communities.

IPTI is a not-for-profit organization comprised of experts who support stakeholders in developing and maintaining effective and efficient property tax systems by providing them with:

- Research and analytical information
- Impartial, objective policy advice
- Strategic advisory and consulting services to create, test and implement policy, and to improve performance through innovative good practice
- Education and training services to enhance professional development and build technical competence
- Property information services to enable more effective decisions
- In addition, IPTI specializes in:
- Property valuation processes: including data collection, mapping and data management; mass appraisal valuation for residential and non-residential properties; quality control
- Property tax collection and enforcement
- Appeal systems
- Technology and process integration and implementation, including data management, data analysis and reporting systems
- Electronic and on-line learning
- Sharing best practice

IPTI has a Board of Advisors which is comprised of internationally respected professionals all of whom have extensive experience in their respective fields. The breadth of membership of the Board reflects IPTI's commitment to international participation and sharing best practice on a global basis. The Board contributes to the strategic direction and overall planning for IPTI.

More information about IPTI can be found on its website www.ipti.org

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IPTI Overview and Summary

Introduction

The initial idea for an international collaboration project emerged from the Conference of Valuation Agencies (CoVA 2022) held at St. Anne's College, Oxford, in the UK on 8-9 December 2022. That was the first in-person conference of its type held since the COVID-19 pandemic lockdown, and it was regarded as a very successful event.

Some of the key organizations that attended CoVA 2022 were keen to ensure that the benefits of sharing information and best practice that took place during the conference were maintained by valuation agencies between such formal events.

With that objective in mind, and having regard to the growing realization among valuation agencies of the need for – and benefits of – increased collaboration between them, three valuation agencies agreed to work together to carry out research into issues that were considered to be being faced by many such organizations around the world.

Those three valuation agencies were:

- The Valuation Office Agency (VOA) in the UK
- The Municipal Property Assessment Corporation (MPAC) in Ontario, Canada
- The Property Valuation Services Corporation (PVSC) in Nova Scotia, Canada

They created a Steering Group comprising the following senior leaders:

- Alan Colston, Chief Valuer, VOA
- Kathy Gillis, CEO, PVSC
- Greg Martino, Vice President and Chief Valuation and Standards Officer, MPAC

Following initial discussions, the Steering Group members agreed to set up the "International Collaboration Project" with the intention that it would involve a number of valuation agencies from around the world which would collaborate with each other in order to achieve the overall objectives of the project.

Those overall objectives, and the benefits of international collaboration, were seen by the Steering Group to include the following:

- Providing a forum where matters concerning the operation of valuation agencies can be considered and discussed.
- Creating an accelerated problem-solving facility for participating valuation agencies.
- Encouraging greater innovation, efficiency and customer service.

- Enabling best practice in the efficient and cost-effective delivery of valuation agency services to be discussed and shared in an appropriate environment.
- Developing networking opportunities for the staff of valuation agencies - at different levels - to exchange views and information relating to their work.
- Building a mutually supportive global network of valuation agencies.
- Supporting benchmarking between valuation agencies.
- Facilitating the exchange of appropriate staff to allow them to gain experience of working in a different valuation agency for a suitable period of time.
- Allowing the results of international research and collaboration to be shared among participating valuation agencies.

The Steering Group considered a number of challenges being faced by many valuation agencies. The initial topics considered by the Steering Group included:

- Staff recruitment and retention
- Training and education for staff
- The valuation of specialized properties
- Identifying best value technology
- Stakeholder relations and effective communications
- Minimizing property tax appeals

After discussion, the Steering Group decided that the most urgent issue for many valuation agencies was staff recruitment and retention. Of particular practical significance, the Steering Group agreed that they would provide resources to carry out the research that would be required to explore the topic and prepare a report with their findings and recommendations.

The Steering Group requested IPTI's assistance in managing the project and working with the resources they committed to undertake the research. It was agreed to proceed by setting up Focus Groups managed by IPTI to deal with the various issues involved.

In September 2024, IPTI published a White Paper entitled **"Future Proofing the Valuation Workforce"** which contained the reports produced by the six Focus Groups concerned along with an overview from IPTI which, inter alia, contained a summary of the main recommendations.

A copy of that White Paper is available on the IPTI website using the following link:

https://www.ipti.org/news/futureproofing-the-valuation-profession-white-paper

That White Paper featured in the next Conference of Valuation Agencies (CoVA 2024) which was held in Dublin, Ireland on 29-30 October 2024. Members of both the Steering Group and some of those involved in the Focus Groups made presentations and led discussions on the issues at CoVA 2024. The conference was again regarded as a very successful event which helped to maintain the momentum of the project.

Following CoVA 2024, the Steering Group decided that the international collaboration project should continue with the next phase (Phase 2) focusing on two topics likely to be of interest to most, if not all, valuation agencies around the world.

Those two topics – one concerned with the use of technology and the other looking at a valuation issue – were:

- To review how valuation agencies are leveraging technology - including artificial intelligence - to modernize/re-engineer their business processes and their interactions with stakeholders, i.e. customers, clients, taxpayers, etc.
- As governments consider new sources of energy to respond to growing consumer demand, to review how valuation agencies are undertaking valuations of new sources of renewable power, electricity generation and other innovative solutions, e.g. small modular nuclear reactors, battery storage facilities, etc.? Are agencies consistent in the collection of data and their methods of assessment? Are there any lessons to be learned from the appeals and resolution of such assessments?

As with what is now regarded as Phase 1 of the International Collaboration Project, the Steering Group agreed that Phase 2 would involve the use of Steering Groups which would be populated partly by staff from their respective organizations and partly with colleagues from around the world drawn from IPTI's international network.

To provide a bit more detail about the nature of the research to be undertaken by the Focus Groups under Phase 2, IPTI provided the following outlines:

Business Process Modernization through Technology

The Focus Groups will, inter alia, look at:

- what types of modern technology valuation agencies are currently using;
- what types of modern technology valuation agencies are planning to use over the next 3 years;
- how are valuation agencies using modern technology to re-engineer their current business processes;
- which business processes have been improved with the implementation of modern technology;
- how valuation agencies are utilizing modern technology to communicate with their stakeholders;
- what modern technology are valuation agencies finding most effective in supporting and improving their interactions with stakeholders.

Valuation of Renewable Energy

The Focus Groups will, inter alia, look at:

- what kinds of renewable energy sources are available within the jurisdiction of the valuation agency concerned;
- what data is available in respect of properties used to provide renewable energy and how the valuation agency is utilizing that data;
- for each different type of renewable energy source, what valuation method or methods are being used to assess these facilities for property tax purposes;
- what issues valuation agencies are facing in connection with these properties – in particular in relation to appeals – and lessons learnt;
- are renewable energy companies cooperating with the valuation agency to assist in understanding the way in which the properties are used and how values should be determined.

Project Timetable

To give an outline of the timetable for Phase 2 of the project, IPTI provided the following:

- Confirmation by the Steering Group of the foregoing terms of reference - December 2024
- VOA, MPAC and PVSC to identify suitable people from their organizations to join the Focus Groups - January 2025
- VOA, MPAC, PVSC to provide IPTI with the names of their resources for Phase 2 - February 2025
- IPTI to meet with the resources made available by VOA, MPAC and PVSC to discuss the project - March 2025
- IPTI to identify resources from global valuation agencies to work with VOA, MPAC and PVSC resources - March 2025
- IPTI to facilitate meetings of the Focus Groups to undertake the research required - April 2025
- Focus Groups to undertake research into the two topics and seek case studies from participating agencies - May to July 2025
- IPTI to oversee the work of the Focus Groups and organize monthly meetings to monitor progress
- IPTI to organize regular online update meetings for the Steering Group and an in-person meeting of the Steering Group during the Property Tax Policy Conference in Halifax, Nova Scotia on 16-17 September 2025
- Focus Groups to prepare draft reports on their findings and recommendations - September 2025
- IPTI to review the draft reports and provide comments to the Focus Groups - October 2025
- Focus Group to consider IPTI's comments and prepare final reports - November 2025

- IPTI to prepare a draft report for the Steering Group on the Focus Groups' work - December 2025
- IPTI to publish a White Paper with an overview and commentary on the research work undertaken - early 2026
- IPTI to prepare an agenda for CoVA 2026 to include the work of the Focus Groups - early 2026
- IPTI to organize an online event at which the work of the Focus Groups could be discussed with interested parties - probably in April/May 2026
- IPTI to organize CoVA 2026 - to be held in Ottawa, Canada on 6-7 October 2026 - at which, inter alia, the White Paper will be discussed.

IPTI is pleased to record that the foregoing timetable was followed and the project remains on track.

During the course of Phase 2 of the project, Kathy Gillis left PVSC and was replaced on the Steering Group by Rebecca Vostermans, also from PVSC.

Focus Groups

As indicated above, the research work was undertaken by Focus Groups using the staff resources provided by the three sponsoring agencies along with colleagues nominated by IPTI to work with them.

The two research topics were split among geographical areas of world as shown below along with the resources available allocated to each Focus Group. The names shown below are the original members of the Focus Groups and the organizations to which they belong.

(a) Business Process modernization

Focus Group 1 – Canada

- George Anderson (VOA)
- Anita Ng (Hong Kong RVD)
- Marco Kuijper (NCREA, The Netherlands)

Focus Group 2 – USA

- Terry Samson (MPAC)
- Ayoub Chouraichi (PVSC)
- Uche Obi (Cayman Land Dept.)

Focus Group 3 – Australia/New Zealand

- Micheal Boateng (MPAC)
- Tom Williams (VOA)

- Danie Malan (City of Cape Town)

Focus Group 4 – Europe

- Lorna White (VOA)
- Mia Parenteau (PVSC)
- Evelyn Khoo (IRAS, Singapore)

Focus Group 5 – Asia

- Mariam Jasat (MPAC)
- Katie Crane-Davis (VOA)
- Peck Yan Nang (IRAS, Singapore)
- Hyacinth Picart (NLA, Jamaica)

(b) Renewable Energy

Focus Group 6 – Canada

- Ryan Ford (MPAC)
- Katherine Cockhill (VOA)
- Llewellyn Louw (City of Cape Town)

Focus Group 7 – USA

- Jodie Parker (MPAC)
- Jack Stamper (VOA)
- Chye Ling Loh (IRAS, Singapore)

Focus Group 8 - Europe

- Thomas Tidy (VOA)
- Laura MacLean (PVSC)
- Chee Hua Mak (IRAS, Singapore)
- Luc Hermans (NCREA, The Netherlands)

Focus Group 9 – Australasia

- Ann Smith-Macquarrie (PVSC)
- Callum Taylor (VG New Zealand)
- Ruud Kathmann (NCREA, The Netherlands)

Although a couple of the people named above had to drop out during the course of the project for work-related reasons, IPTI is grateful to all Focus Group members for the time and effort they

devoted to undertaking their research and preparing the reports that are contained in the appendices to this White Paper.

We should add that, although the Focus Group reports have been slightly edited for the purposes of this White Paper in relation to format, font size, etc., the content of those reports has not been amended and remains the work of the Focus Group members.

As the two topics researched under Phase 2 are quite different, IPTI decided to produce two White Papers, each dealing with one of the two topics. This IPTI White Paper deals with business process modernization. The other IPTI White Paper deals with the valuation of renewable energy properties.

Both White Papers are on the IPTI website: **www.ipti.org/property-tax-papers**

Summary of Findings and Recommendations

IPTI strongly recommends that those interested in the findings and recommendations should read the Focus Group reports appended to this White Paper. They will provide not only the detail of the various recommendations, but also the context in which they have been made.

Inevitably, many of the findings and recommendations of the Focus Groups within each of the two parts of Phase 2 overlap as they were researching the same topics, albeit in different parts of the world.

However, to provide a broad indication of the key findings and recommendations, IPTI provides the following summary based on the content of the Focus Group reports.

Business Process Modernization through Technology

Before getting into findings and recommendations, the following **key challenges** were identified by some of the Focus Groups:

- The explainability of AI and machine learning

A key challenge is to ensure that valuations produced by AI/machine learning models are explainable, transparent and defendable for both internal staff and external stakeholders. There is also a need to maintain human oversight of AI/machine learning workflows to ensure transparency and build public trust in the AI driven valuation process. It is important to emphasize the role of human validation and quality checks in ensuring accurate values.

Steering Group comment: It is however possible to use "black box" AI in parallel to explainable AI in order to act as a comparison and provide some assurance of the main tool outputs. Human intervention clearly works to determine how to respond to the different outputs.

- Resource implications of advanced technology

The implementation and licensing of advanced technologies, such as GIS platforms, LIDAR systems, and hardware/software for AI and machine learning, often entail substantial financial costs and resource demands. Beyond monetary expenditures, these technologies are highly resource-intensive, demanding specialized personnel for operation and maintenance, extensive staff training to ensure effective utilization and significant time for system integration, which can strain organizational budgets and operational capacity in valuation agencies.

Steering Group comment: This should be overcome by the expected benefits of increased consistency and efficiency and should therefore, in net terms, not be a relevant point. Otherwise, the system should not be invested in to begin with. We have, however, identified that modern and more robustly designed process often demand additional process effort/assurance up front – which should be the lower value/cost work, whereas the valuation work should be more efficient.

- Legal and jurisdictional concerns

A significant legal concern involves the permissible valuation methods. Depending on jurisdictional legislation, valuation by machine learning models may not be a permissible method for property assessment, as the method for conducting property assessment may be prescribed under law.

Steering Group comment: The legal/jurisdictional concern only relating to AI as a predictive valuation tool is rather narrow. We would like to acknowledge that other uses of AI in property assessment also have legal and business implications, e.g., data privacy and disclosure, the public's use of AI to build appeal cases, etc.

- Change management and upskilling of workforce

Advanced technology such as AI/machine learning will bring about job role changes, requiring assessors to acquire new skill sets to handle more complex tasks and leverage AI capabilities. There is a need to invest in training and upskilling for assessors to adapt to technology shifts and reduce resistance. Additionally, soft skills, continuous learning and trust in the organization are very important to cope with rapidly progressing technologies. Agencies should also nurture a culture that is adaptable to new technologies / processes.

Steering Group comment: In relation to the first sentence above relating to job role changes, etc., probably, but not necessarily and maybe not that extensive. More subtle implementation of AI (or predictive analytics) merely provides the first step to the valuer who does not have to start with a "blank sheet". An organisation can evolve the use of AI incrementally which will enable a more considered adoption by their staff.

Moving on to **findings**, a key conclusion is that technology adoption in property valuation is no longer optional but essential to maintaining operational efficiency and public trust. Agencies are already realizing significant benefits in data quality, process automation, and customer service. However, the pace of innovation also brings new challenges related to explainability of AI models, data governance, legal compliance, and workforce adaptation.

Another key finding is that technological modernization is as much about organizational culture as it is about tools. Agencies that foster a culture of innovation and continuous learning are better positioned to adapt to evolving technologies and stakeholder expectations. Strengthening such a culture does not happen automatically. It requires a deliberate change-management strategy, clear support from senior leadership, and the willingness to start small with new technologies and build from the ground up.

Modernization is not simply a technological upgrade but a strategic transformation of how property assessments are conducted and managed. The jurisdictions that act now through research initiation, investing in scalable solutions, and fostering a culture of continuous improvement will be best positioned to achieve sustainable operational excellence. In the long term, these efforts will bring

tangible benefits: more accurate assessments, higher efficiency, and a more equitable system that better serves both governments and the communities they support.

A review and analysis of all findings provide clear and consistently visible patterns across jurisdictions related to the modernization of property valuation systems. All projects are different, with their own context and scope, yet the emerging themes indicate a broad shift towards data-driven assessment practices that are efficient and equitable. The evolving workforce, implementation of technology, and valuation processes are at the heart of these changes, resulting in measurable benefits in data quality, operational efficiency, and transparency.

The keys to successfully delivering a technology project include an understanding of requirements from project stakeholders, an adaptable scope and capacity, and change management planning for end users. As technology and the needs of the organization are constantly evolving, continuous technological improvements will avoid large gaps and painful upgrades in the future, ultimately leading to higher quality products and efficient deliveries.

Steering Group comment: agreed, but that goes hand in hand with stakeholder (or the design team representing them) need to understand the capabilities of the technology and the business roadmap.

Turning to **recommendations**, below are some that the Focus Groups provided. As already indicated, there is unavoidably some overlap between them.

- Conduct a technology asset audit

Catalogue all current systems, databases, and integrations. Flag technologies that are out of support or approaching end-of-life and align findings with the organization's technology strategy to prioritize replacements.

Steering Group comment: in relation to the first sentence above, need to add "and technology gaps or where technology is creating bottle necks/inefficiencies."

- Assess data quality

It is important to assess data quality for relevant data sources prior to building AI models or developing analytics. This includes understanding how the data is collected, coded, aggregated, and why data may be missing. Establish clear working definitions and exclusion criteria for the purposes of each analysis. Data cleaning should be done to resolve potential data issues prior to any analysis.

Steering Group comment: need to assess core data requirements, i.e. to ensure the business only collects and maintains what it needs to undertake its function. It is also important to note that the processes and workflows around how data is touched and transformed throughout a valuation cycle are a major contributor to data quality. Controls around who, how, when, data is use and transformation is just as important as having "clean" data to start with.

- Accelerate AI and automation

To enhance operational efficiencies and keep pace with the rapid technological advancements, valuation agencies should identify opportunities to embed AI and machine learning across key functions. This includes predictive valuation models, anomaly detection and customer service enhancements. Advanced applications, such as computer vision for property image analysis and predictive modelling for rental and market trends, should be explored. Success will depend on access

to high-quality data and the implementation of robust, transparent AI governance to uphold public trust.

- Invest in modern business technologies

This should include CAMA systems, cloud-based platforms, and AI for support functions whilst ensuring legal defensibility for statutory valuations. Plan future technology adoption focusing on platform capability enhancement, real-time processing, and predictive analytics.

- Invest in unified digital platforms

Centralized, cloud-based platforms improve consistency, scalability, and transparency. Integration with geospatial data and external systems enhances valuation accuracy and operational efficiency.

- Leverage automation and AI responsibly

Automated Valuation Models (AVMs) and AI tools should be adopted for support functions such as quality assurance, triage, and data analysis. Statutory valuations should remain under human oversight until AI tools meet legal and ethical standards for defensibility and transparency.

Steering Group comment: human oversight should be proportionate to the quality of AI tooling.

- Strengthen AI governance and transparency

Develop clear frameworks to ensure that AI and machine learning applications are explainable, auditable, and compliant with legislative requirements. Establish internal review mechanisms and external communication strategies to build stakeholder confidence in AI-supported valuations.

- Re-engineer business processes

To leverage automation, consolidate fragmented systems, and enable lean operational models through strategic technology deployment.

- Develop new analytics tools

Development of new analytics tools and AI approaches must consider the organization's computational resources, implementation timelines, desired outcomes, and final operational processes, as they will influence the suitability of different statistical or AI models.

- Necessary resources

Ensure that the organization has the necessary resources to support implementation of an analytics and/or AI development strategy. Data analysts, data scientists, data engineers, or statisticians might be needed, depending on the specific developments of the organization.

Steering Group comment: there is a need for cross functional teams, i.e. not working in isolation.

- Invest in workforce upskilling

Implement structured training programs that combine technical skills (e.g., data science, GIS, and model interpretation) with soft skills such as adaptability and communication. Encourage continuous professional development to prepare assessors for evolving roles.

Steering Group comment: and need for cross skilling to appropriate levels, e.g. surveyors, valuers, assessors getting the right level of analytical training and vice versa; not all need to get the same – it depends on role.

- Invest in workforce transformation

Introduce structured reskilling/upskilling programs focused on data analytics, AI and digital service delivery. Support staff through digital literacy and change management initiatives to build confidence and foster adoption. Establish clear career pathways aligned with emerging technology roles to retain talent and future-proof the workforce.

- Enhance inter-agency collaboration

Facilitate knowledge-sharing and joint innovation projects among valuation agencies to leverage economies of scale, share best practices, and accelerate technology adoption in smaller jurisdictions. To extend this knowledge-sharing, agencies could participate in international symposia to exchange experiences, make use of international organizations (such as IPTI), and engage in structured international collaboration projects.

- Adopt scalable and modular technology strategies

Pursue flexible, modular technology solutions (e.g., APIs, cloud platforms, open data standards) that can evolve with business needs and reduce long-term integration costs.

- Promote responsible innovation and stakeholder engagement

Engage property owners, local governments/municipalities, and other stakeholders early in technology changes. Tools such as virtual inspection apps, online portals, and multilingual chatbots can improve accessibility and transparency.

- Don’t limit modernization to a single process

There are multiple aspects of assessment valuation and administration that can be improved, including data collection, data modelling, appeals processing, and quality control. Assessment jurisdictions should evaluate all areas of their business, such as their data collection, valuation modelling, or review/appeal processes to analysis if any areas are inefficient and/or identify the area that is the least efficient.

- Start small

Start with smaller modernization projects rather than attempting to overhaul all processes at once. Approach it in a realistic manner, breaking down modernization goals into smaller, targeted initiatives. Approaching modernization projects in this manner should provide more focus and result in a measurable success while reducing risk.

Steering Group comment: agreed, unless your main system is so far out of support that your whole business is at risk.

- Plan for downstream impacts

When modernizing a single step in the process, consider how it interacts with downstream workflows and how it will integrate with future modernization efforts.

- Adopt agile frameworks

New systems and processes should be developed in a way that allows for adaptability. Building with agility enables jurisdictions to refine processes over time and respond to new requirements, technologies, or legislative changes.

- Measure and monitor technology improvements

Through performance metrics, processing times, and stakeholder satisfaction to demonstrate tangible benefits.

Steering Group comment: this should include things like valuation outcomes, tax-base stability, reduced challenge volumes/percentages, etc.

- Prioritize stakeholder communication

Through self-service portals, transparent tracking systems, and innovative public education strategies that build trust and understanding.

- Deploy unified platforms and integrated systems

These should be the most effective technologies for comprehensive stakeholder interaction and workflow management.

- Enhance stakeholder engagement

Provide user-friendly, self-service portals for property owners to access valuation data, submit objections, and receive updates. Use personalized communication strategies to improve public understanding and trust.

- Develop a property taxpayer portal

Develop a taxpayer portal that offers self-service options (view valuations, submit evidence, etc.), integrates chatbot support for FAQs and guidance, and aligns with government standards for accessibility and security.

- Strengthen Data Governance and Interoperability

Ensure secure, standardized data management across agencies. Promote interoperability between valuation systems and national land information databases to support real-time updates and policy integration.

- Balance Delivery Models Strategically

Consider hybrid models that combine in-house expertise with outsourced innovation. Align service delivery with strategic goals, capacity, and long-term sustainability.

- Foster a Culture of Continuous Improvement

Treat digital transformation as an ongoing process, not a one-off event. Invest in staff training, change management, and stakeholder collaboration to embed new technologies effectively.

- Work collaboratively

Establish joint working groups with municipalities/local authorities to co-design future data exchange models. Forums can also be used to align priorities, pilot new technologies, and resolve blockers collaboratively. The data exchange model should include:

  - API-based integration for real-time updates
  - Clear data ownership and usage agreements
  - A shared metadata schema to ensure interoperability
  - Secure transfer (e.g. encrypted upload portals)

- Feedback loop for corrections and updates

A helpful **implementation plan** provided by the Focus Groups is as follows:

- Short term

Research and identification of the assessment process that are inefficient. Research should focus on proven modernization techniques that offer the greatest ROI, informed by case studies or implementation by other jurisdictions.

- Medium term

Planning and early implementation. Once areas of improvement are identified, detailed planning must begin. Planning is critical. While less exciting than implementation, it is the step that will determine the success of modernization.

- Long term

Full implementation and integration. Broader modernization efforts should follow, recognizing that many processes will require substantial testing, change management, and in some cases, policy or legislative updates. As new processes are implemented, integration across functions should be carefully managed to ensure that future modernization steps complement one another rather than creating silos.

Further Reading

The Focus Groups provided helpful references to source material for anyone who would like to find out more about the topics that have been researched.

Additional International Collaboration Initiatives

In addition to the research undertaken by the Focus Groups, another international collaboration initiative was that, during 2025, the VOA sent a total of nine members of its staff out to various provinces in Canada on what it called "externships". The placement of the staff was facilitated by IPTI using its contacts in the provinces concerned.

Below is a copy of the plan prepared by the VOA setting out the various stages of the externship program.

Ref.	Workstep	Start date	Finish date	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25
1	Set-up and planning.										
2	Create work plan.										
3	Preparation - including defining the scope and objectives of your research to align with the overall project questions outlined above.										
4	Define the key technology terms - utilise existing definitions.										
5	Initial research - using online facilities to identify potentially useful stakeholders, helpful reports, research papers, case studies, etc.										
6	Engagement with suitable participants - to include Canadian assessing agencies, relevant professional bodies, technology companies, etc.										
7	Recording of findings.										
8	Analysis of findings.										
9	Conclusions drawn from your research.										
10	Recommendations based on your conclusions.										
11	Preparation of draft report.										
12	Final report ready.										

The VOA staff members who participated in the externship program and the provinces which agreed to host them are as follows:

- Marcel Sarmiento – Nova Scotia
- Anya Lewis – Nova Scotia
- Alice Vaughan-Williams – Nova Scotia
- Adam Hall – Ontario
- Keira Gaunt – Ontario
- Louis Berrow – Alberta
- Will Robinson – Alberta
- Isobel McCully – British Columbia
- Oliver Peers – British Columbia

The collaboration initiative involved the VOA staff being hosted in the valuation agencies in the provinces concerned for a period of two weeks prior to IPTI's "Property Tax Policy" conference which was held in Halifax, Nova Scotia on 16-17 September 2025. Following their two-week externship, the VOA staff travelled from their various host provinces to attend the IPTI conference at which they provided a brief report of their experiences.

It was clear that not only had the VOA staff all enjoyed their experience and found it very informative, the host agencies had benefited from having the VOA staff with them and sharing information about the way in which the various agencies approached similar work requirements.

When the staff returned to the VOA, they provided more detailed reports about what they had experienced during the course of their externship.

Following this initiative, the VOA approached IPTI to suggest how this experience could be spread to other parts of the world. IPTI has provided the VOA with a suggested three-year plan for which valuation agencies around the world might be prepared to host selected VOA over the next three years.

In IPTI's view, this is a very practical example of international collaboration in action and we would welcome contact from any valuation agency reading this report to get in touch with us if they would like to participate in a similar scheme either in terms of hosting staff from other organizations or sending their own staff to other agencies in order to benefit from the experience.

Next Steps

Having now concluded Phase 2 of the International Collaboration Project with the publication of this White Paper, IPTI is involved in three follow up activities:

1. Discussion with members of the Steering Group about the topic or topics to be included in Phase 3 of the project.
2. The organization of an online event – probably in May 2026 – at which the Phase 2 Focus Group members will be invited to share their findings and discuss their recommendations with other valuation agencies around the world.

3. The organization of the next Conference of Valuation Agencies (CoVA 2026) to be held in Ottawa, Canada on 6-7 October 2026. This White Paper will feature in CoVA 2026.

Conclusion

In IPTI's view, this project has been extremely worthwhile and we hope that readers of this White Paper will find it of value.

In particular, we are keen to find out whether the recommendations it contains are ones that valuation agencies will find not only useful, but also practical.

We welcome comments about the contents of the White Paper and look forward to discussing the outcome of the project with anyone who would like to get in touch with us.

If anyone would like to ask and questions or provide any commentary about the White Paper, please send an email to the following address and we will be in touch: info@ipti.org

Focus Group Number 1
Business Process Modernization:
Canada

Group Members:

- George Anderson (VOA)
- Anita Ng (Hong Kong RVD)
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Overview

This research aims to examine how valuation agencies in Canada are leveraging technology, including artificial intelligence (AI), to modernize and re-engineer their business processes and enhance interactions with stakeholders.

By identifying the strategies adopted by these agencies, this research aims to provide practical recommendations on how valuation agencies can optimize the use of modern technology to improve their operational efficiency and stakeholder engagement.

Scope and Objectives

The scope of this research is confined to three Canadian agencies (listed in alphabetical order):

- *BC Assessment (BCA)* in British Columbia;
- *Municipal Property Assessment Corporation (MPAC)* in Ontario; and
- *Property Valuation Services Corporation (PVSC)* in Nova Scotia.

The objectives of this research are to review:

- The current technology usage by valuation agencies;
- The use of modern technology to re-engineer agencies' business processes;
- The utilization of modern technology for communication with stakeholders; and
- The types of modern technology that agencies plan to adopt over the next three years.

Research Approach

This research has been undertaken using the following approaches:

- A review of online and publicly available information about BCA, MPAC and PVSC; and
- Discussions with the representatives from the valuation agencies:
    - Michael Spatharakis from BCA
    - Greg Martino and Ivan Marinkovic from MPAC
    - Rebecca Vorstermans, Jeff Caddell and Jamie Murphy from PVSC.

Details of interviews are in **Appendix I**.

Summary of Findings

The summary of findings is in **Appendix II**.

Key challenges arising from technology adoption

Based on the findings and discussions with the participating agencies, the key challenges arising from technology adoption are summarized as follows:

- **'Explainability' of AI and machine learning**
  A key challenge is to ensure that valuations produced by AI / machine learning models are explainable, transparent and defendable for both internal staff and external stakeholders. There is also a need to maintain human oversight of AI / machine learning workflows to ensure transparency and build public trust in the AI driven valuation process. It is important to emphasize the role of human validation and quality checks in ensuring accurate values.

- **Resource Implications of Advanced Technology**
  The implementation and licensing of advanced technologies, such as GIS platforms, LIDAR systems, and hardware/software for AI and machine learning, often entail substantial financial costs and resource demands. Beyond monetary expenditures, these technologies are highly resource-intensive, demanding specialized personnel for operation and maintenance, extensive staff training to ensure effective utilization and significant time for system integration, which can strain organizational budgets and operational capacity in valuation agencies.

- **Legal and jurisdictional concerns**
  A significant legal concern involves the permissible valuation methods. Depending on jurisdictional legislation, valuation by machine learning models may not be a permissible method for property assessment, as the method for conducting property assessment may be prescribed under law.

- **Change management and upskilling of workforce**
  Advanced technology such as AI / machine learning will bring about job role changes, requiring assessors to acquire new skill sets to handle more complex tasks and leverage AI capabilities. There is a need to invest in training and upskilling for assessors to adapt to technology shifts and reduce resistance. Additionally, soft skills, continuous learning and trust in the organization are very important to cope with rapidly progressing technologies. Agencies should also nurture a culture that is adaptable to new technologies / processes.

Conclusion

The three Canadian valuation agencies - BC Assessment (BCA), the Municipal Property Assessment Corporation (MPAC), and the Property Valuation Services Corporation (PVSC) - are at different stages of technological advancement, yet all demonstrate a clear commitment to modernizing their operations. Each agency has leveraged a mix of geographic information systems (GIS), machine learning, data analytics, and digital communication tools to improve efficiency, transparency, and stakeholder engagement.

A key conclusion is that technology adoption in property valuation is no longer optional but essential to maintaining operational efficiency and public trust. Agencies are already realizing significant benefits in data quality, process automation, and customer service. However, the pace of innovation also brings new challenges related to explainability of AI models, data governance, legal compliance, and workforce adaptation.

Another key finding is that technological modernization is as much about organizational culture as it is about tools. Agencies that foster a culture of innovation and continuous learning are better positioned to adapt to evolving technologies and stakeholder expectations. Strengthening such a culture does not happen automatically. It requires a deliberate change-management strategy, clear support from senior leadership, and the willingness to start small with new technologies and build from the ground up.

In conclusion, while Canadian valuation agencies are global leaders in technology-enabled mass appraisal, their continued success will depend on strategic investment in people, governance, and collaboration - both within Canada and internationally.

Recommendations

Based on the conclusions, the following recommendations are proposed:

1. **Strengthen AI Governance and Transparency**
   Develop clear frameworks to ensure that AI and machine learning applications are explainable, auditable, and compliant with legislative requirements. Establish internal review mechanisms and external communication strategies to build stakeholder confidence in AI-supported valuations.

2. **Invest in Workforce Upskilling**
   Implement structured training programs that combine technical skills (e.g., data science, GIS, and model interpretation) with soft skills such as adaptability and communication. Encourage continuous professional development to prepare assessors for evolving roles.

3. **Enhance Inter-Agency Collaboration**
   Facilitate knowledge-sharing and joint innovation projects among Canadian valuation agencies to leverage economies of scale, share best practices, and accelerate technology adoption in smaller jurisdictions. To extend this knowledge-sharing beyond Canada,

agencies could participate in international symposia to exchange experiences, make use of international organizations (such as IPTI), and engage in structured international collaboration projects.

4. **Adopt Scalable and Modular Technology Strategies**
   Pursue flexible, modular technology solutions (e.g., APIs, cloud platforms, open data standards) that can evolve with business needs and reduce long-term integration costs.

5. **Promote Responsible Innovation and Stakeholder Engagement**
   Engage property owners, municipalities, and other stakeholders early in technology changes. Tools such as virtual inspection apps, online portals, and multilingual chatbots can improve accessibility and transparency.

Reflection

The International Collaboration Project has been an ongoing initiative involving stakeholders from the United Kingdom (George Anderson of Valuation Office Agency), Hong Kong (Anita Ng of Rating & Valuation Department), and The Netherlands (Marco Kuijper of the Netherlands Council for Real Estate Assessment).

The project has focused on technology integration by Valuation Agencies in Canada, Focus Group coordination, and strategic reflections, with virtual meetings held between May and August 2025.

Responsibilities have been equally allocated with clear task division including initial research of the Canadian agencies, approaching and undertaking in-depth interviews of personnel from these, summarizing key challenges and identifying recommendations. Technology has been a required enabler for the success of this project with Teams meetings and sharing documents electronically thus streamlining collaboration.

To advance the research to the subsequent stage, the report authors suggest the incorporation of stakeholder surveys. For example, gathering feedback from valuation agency clients and customers regarding their experiences with modern technology, as well as understanding how BCA, MPAC, and PVSC employees are utilizing contemporary technological tools, would provide valuable insights.

Our thanks to BCA, MPAC and PVSA representatives for providing invaluable interview time. Further thanks to Paul Sanderson of IPTI for both coordinating this international collaboration project and affording George, Marco and Anitia the opportunity to be part of it.

References

BCA

- *A Review of the Methods, Applications and Challenges of Adopting AI in the Property Assessment Office* (IAAO, 2022)
- BCA's Annual Reports
- BCA's Service Plans

MPAC

- "About My Property" online portal (https://www.aboutmyproperty.ca/#/auth/home)
- Home Values Matter Homepage and Youtube videos to address most common client questions (https://www.mpac.ca/valuematters, https://www.youtube.com/watch?v=wWMOJc4_c_s)
- Property Pulse / Insight Dashboard to deliver valuable data-driven insights to the public. (https://www.mpac.ca/en/HousingInventory)

PVSC

- Rotman Insights Hub – How PVSC Revolutionize valuation with AI (https://www-2.rotman.utoronto.ca/insightshub/ai-analytics-big-data/adding-value-ai)
- IPTI/ IMA webinar – Use of AI in Derivation of Assessed Values (20 March 2025)

Appendix I - Summary of Interviews

Date	31 July 2025 (Thursday)	1 August 2025 (Thursday)	6 August 2025 (Wednesday)
Interviewed Oorganization	Municipal Property Assessment Corporation (MPAC)	BC Assessment (BCA)	Property Valuation Services Corporation (PVSC)
Interviewee(s)	- **Greg Martino,** Vice-President (Valuation and Standards); - **Ivan Marinkovic,** Vice-President (IT)	- **Michael Spatharakis,** Director, Mass Appraisal Standards & Solutions	- **Rebecca Vorstermans,** Vice-President (Stakeholder Relations & Communications); - **Jeff Caddell,** Director of Valuation Standards; - **Jamie Murphy,** Director of Operations
Interviewer / facilitator	- **Marco Kuijper (**Waarderingskamer)	- **George Anderson** (VOA)	- **Anita Ng** (RVD)
Summary of interview notes	**Appendix III**	**Appendix IV**	**Appendix V**

Appendix II - Summary of Findings

BCA	MPAC	PVSC
Focus Area: Current use of modern technology - Data collection		
Property data Ortho/oblique aerial, high-resolution street-front, satellite imagery; electronic data from civic governments (building permits, plans, applications, amendments); field tablets; GIS applications; real estate listings; sales reviews; analytical sampling with blank field cards; Eagle View integration for change detection; Citrix Sharefile/email for sharing; directed owner requests **Transaction data** Automated data feeds from BC Land Title and Survey Authority; access to Multiple Listing Service (MLS) applications; Manufactured Home Registry reports; and civic, provincial, and Indigenous government rental agreements.	**Property data** Tablets and mobile devices with integrated measuring tools and sketching apps for on-site property data collection (syncs to backend when online) Paper / form returns from property owners. **Transaction data** Annual feed of sales data from Teranet and Land Registry, covering all sales transactions at all property types in Ontario.	**Property data** Tablets with mobile app named "Mobile Assessor" for on-site property data collection (data cloud solutions to upload to server, and data will be integrated into their system via API after review and approval. Pictometry services through Eagle View, which is integrated into their system and it captures high-resolution imagery. It allows overlay of components such as parcels to help monitor changes in development across the province. **Transaction data:** Sales information is collected nightly from the province and reviewed to update property records. Online tools on website which allow property owners to fill in requested income information.
Focus Area: Current use of modern technology - Data analytics, valuation & quality check		

BCA	MPAC	PVSC
Analytics tools: Microsoft SSRS, SSIS, PowerBI, Excel, RStudio CAMA system: Tyler Technologies Enterprise Assessment and Tax Predictive modeling: R-Studio, R-Shiny, PowerBI dashboards.	A cloud-based valuation as a service platform since 2012. Use of Python for developing valuation models. Development of AVMs that is updated biweekly and made available to commercial clients for validating loans and other financial transactions. AVM like XGBoost using machine learning to analyze property sales, features, and market trends, create adjustment graphs, dashboards for residential properties.	Data cleansing using R to identify and address data anomalies. Machine learning tools in R with multiple models (including Gradient Boosting Models and Generalised Additive Models) are used to value residential properties. Sales comparable tool returns up to 10 comparable properties based on various criteria, such as geography, type similarity, age, etc., helping assessors validate the machine learning values by automatically identifying the accounts that fall outside of an acceptable value range. Cost based tool for valuers to shift to cost approach valuation if necessary.
Focus Area: Current use of modern technology - Communication with stakeholders		
"Assessment Search" (interactive website) for comparisons/equity confirmation; online assessment notices during inquiry period; interactive GIS maps for market trends and property values. Authenticated taxing authority website portal for retrieval of annual assessment roll data files, self-serve assessment roll reporting, and submission of electronic information.	"About My Property" online portal where homeowners can view and access property characteristics and assessed values, triggering inquiries and updates. Customer service chatbot prototypes and YouTube video tutorials for stakeholder engagement.	"My Property Report" online portal where property owners can log in and see detailed information about their property. Use secure FTP sites for file sharing with stakeholders, such as municipalities and real estate agents.

BCA	MPAC	PVSC
Focus Area: How valuation agencies using modern technologies to re-engineer their current business processes		
Imagery change-detection software to trigger physical data collection and validate inventory, reducing the need for on-site visits. Automated data feeds and integration, reducing manual entry and saving administrative resources. AI-assisted workflows: automated comparable sales selection, natural language processing on permits, scripted data validation and audit corrections to minimize errors. Predictive modeling and structured mass appraisal process (model specification, calibration, review) for residential valuations, improving efficiency and roll quality (fewer audit hits). Web-based tools and portals reduce paper notifications, manual exchanges, and inquiries by providing self-serve access to data and reports. Electronic forms and APIs for two-way information exchange with stakeholders, streamlining submission and consumption of data. Statistical sampling in data maintenance program to test and rectify inventory accuracy efficiently.	AI/OCR for automating appeal documents matching and processing. AI/OCR pipeline processes appeals requests, auto-matches documents to records, and routes exceptions to specialists for faster resolution. use of AI to analyze and measure building plans, improving accuracy and efficiency in determining property dimensions and characteristics. Property inspectors collect and sketch data digitally on tablets - eliminates paper forms, reduces travel time, and ensures rapid backend updates.	Assessors handle appeals and use data science tools to prioritize and expedite appeals based on certain criteria. This allows them to move through appeals quickly and efficiently. Apply machine learning in strategy and insight reporting, e.g. workload reports, to facilitate case and manpower management and increase organizational efficiency. Remote site visits and machine learning models allow better efficiency in valuation process.

BCA	MPAC	PVSC
Focus Area: Future planning of leveraging modern technologies		
Expanded use of APIs and electronic forms for data consumption from reliable sources, eliminating manual entry. Exploration of imagery and GIS-based feature extraction using AI/machine learning. Use of GIS technology to verify property attributes and identify new features for modeling. Different types of regression and machine learning models for residential properties, planning, and forecasting. Newer version of SharePoint, modern authentication management, and expanded APIs for enhanced web presence and notifications. Multi-year implementation strategies for new technologies should be adopted.	Transition from tablets to assessors' personal smartphones for data collection (leveraging existing devices and reducing hardware costs)—targeted within next 2–3 years. PoC for developing the Home Porter app, allowing property owners to conduct virtual inspections via video phone call with property inspectors, reducing the need for physical site inspections. Integrate real-time LIDAR, drone surveys for large-scale property data collection, using high-resolution imagery and internal algorithms. Enhance chatbot with multilingual support and voice interface.	Incorporate more spatial attributes into their machine learning model and provide more insights to the valuation team on how properties are impacted by certain amenities and geographic factors. Start an innovation portfolio where staff can propose ideas for reengineering business processes and these ideas will be evaluated for feasibility and potential benefits. Digitization of workflows to improve efficiency, including better utilization of their website for service delivery and potentially delivering assessment notices through digital means. Enhance the quality review process by developing validation models Develop a data quality improvement strategy.

Appendix III - MPAC Meeting Notes

International Research Collaboration Phase 2 - Leveraging Technology by Valuation Agencies in Canada

Interview with Municipal Property Assessment Corporation (MPAC), Canada

Date: 31 Jul 2025 (Thu)
Time: 8:30am [Canada] / 1:30pm [UK] / 2:30pm [Netherland] / 8:30pm [HK]
Present:

Greg Martino (MPAC)	Ivan Marinkovic (MPAC)
George Anderson (VOA)	Marco Kuijper (Waarderingskamer)
Anita Ng (RVD)	Vincent Lai (RVD)
Michael Choi (RVD)	Michael Yau (RVD)

Interview Notes

Data Collection Technologies: Ivan and Greg discussed the modernization of data collection technologies at MPAC, including the use of tablets and mobile devices for property assessors, and the potential future use of cell phones for data collection.

- **Modernization Efforts:** Ivan explained that MPAC started modernizing their technology in collecting property data, including property assessors visiting properties and processing digital inspections of building plans and permits. They aimed to streamline and make data collection easier for their staff.
- **Use of Mobile Tablet:** Ivan detailed the use of tablets for property assessors, combining measuring devices and sketching apps to collect information in one go. This allows syncing data with backend systems when network connection is available.
- **Considering Future Use of Cell Phones:** Ivan mentioned the potential future shift to using cell phones for data collection, leveraging the devices already in assessors' pockets, though this is a few years ahead.
- **Efficiency and ROI:** Ivan highlighted that modernizing data collection with tablets provides the highest return on investment as it can minimize manual data handling and improve efficiency.
- **Online Portal for Business Properties:** Greg described the online portal developed for business properties, where property owners can submit financial statements and rent rolls to support the valuation process.

Homeowner Data Collection: Greg and Ivan discussed the past and future efforts to collect data from homeowners, including the use of an online portal and a proof of concept for a video call app to conduct virtual inspections.

- **Past Efforts:** Greg mentioned that they previously sent out assessment record confirmation forms to homeowners to confirm property details, but paused due to compliance and quality issues.
- **About My Property Portal:** Greg described the "About My Property" online portal (https://www.aboutmyproperty.ca/#/auth/home) where homeowners can view and access property characteristics and assessed values, triggering inquiries and updates.
- **Home Porter App:** Ivan discussed the proof of concept for the Home Porter app, allowing property owners to conduct virtual inspections via video phone call with property inspectors, reducing the need for physical site inspections.

Digital Information Sources: Ivan and Greg explained the shift towards obtaining data from digital sources, such as high-resolution satellite imagery and LIDAR, to collect information on properties and detect changes without on-site inspections.

- **Use of LIDAR:** Ivan shared that MPAC started experimenting with LIDAR to collect information, such as identifying parking lots in Toronto for taxation purposes, using high-resolution imagery and internal algorithms.
- **Satellite Imagery:** Ivan explained the use of high-resolution satellite imagery to detect changes on properties, such as new pools, by comparing historical images and triggering updates to their systems.
- **Cost and Efficiency:** Greg noted that on-site inspections are costly and sometimes impractical, especially for domestic properties. Therefore, they are exploring alternative methods like digital imagery and third-party authoritative sources to validate and collect information.

Valuation Models and Techniques: Ivan and Greg outlined the transition from traditional valuation methods to cloud-based solutions, using Python for model development, and experimenting with machine learning for property valuation.

- **Transition to Cloud:** Ivan explained the shift from Oracle database stored procedures to a cloud-based valuation as a service platform since 2012, allowing self-service for model running and reducing IT involvement.
- **Model Development:** Greg highlighted the use of Python for developing valuation models, moving away from SPSS, and ensuring scalability and performance.
- **Machine Learning:** Greg mentioned experimenting with machine learning for property valuation, particularly for residential properties with high degree of homogeneity and a lot of sales information, to enhance model accuracy and explore new valuation methods.
- **Explainability:** Greg noted the challenge of ensuring explainability for machine learning models, both for internal staff and external stakeholders, to maintain transparency and trust in the valuation process.

- **Automated Valuation Model (AVM):** Greg explained the development of an AVM that is updated biweekly and made available to commercial clients for validating loans and other financial transactions.

AI Integration in Re-engineering Business Processes: Ivan and Greg discussed the integration of AI into various business processes at MPAC, including data accuracy, quality improvement, and handling appeals and building plans.

- **Data Accuracy:** Ivan explained the use of AI to improve data accuracy and quality, reducing the need for manual data cleansing and enhancing property valuation.
- **Handling Appeals:** Ivan described using AI and OCR capabilities to streamline the RFI process (reviewing documents) for handling appeals, automating the matching and processing of requests.
- **Building Plans:** Ivan shared the use of AI to analyze and measure building plans, improving accuracy and efficiency in determining property dimensions and characteristics.

Future Impact of AI: Ivan and Greg shared their vision for the future impact of AI on MPAC, including changes in job roles, skill sets, and the potential for AI to handle complex tasks and improve data accuracy.

- **Job Role Changes:** Ivan and Greg discussed how AI will change job roles, requiring new skill sets for assessors or valuers to handle more complex tasks and leverage AI capabilities.
- **Data Accuracy:** Ivan emphasized the potential of AI to significantly improve data accuracy and quality, impacting property values and reports provided to stakeholders.
- **AI Strategy:** Ivan mentioned that AI is built into MPAC's strategy for the next four years, with numerous use cases identified for improving business processes and data management.

Human Oversight in the Valuation Process and Customer Service: Greg emphasized the importance of human oversight in the valuation process and customer service, ensuring transparency and trust in the information provided to stakeholders.

- **Human Oversight:** Greg stressed the need for human oversight in the valuation process to ensure transparency, trust, and accuracy in the information provided to stakeholders.
- **Customer Service:** Greg highlighted the importance of maintaining high-quality customer service, balancing the use of AI (e.g. Chatbot) with human interaction to address complex issues and provide personalized support to their difficult customers.

Transaction Data Collection: Greg explained how MPAC collects transaction data, including sales data from Land Registry and income & expense information directly from property owners.

- **Sales Data:** Greg explained that MPAC receives an annual feed of sales data from Teranet and Land Registry, covering all sales transactions at all property types in Ontario, which is used for valuation models and parameters.
- **Income & Expense Data:** Greg described collecting income and expense information directly from property owners for income-producing properties, used to develop fair market rent models and other valuation parameters (e.g. capitalization rates, vacancy or recoverable allowances).

Follow-up tasks:

- **Sharing Research Results:** Send the results of the research to Ivan and Greg once the report is completed and published. (Marco)
- **Conference Attendance Coordination:** Coordinate with Ivan and Greg regarding attendance and potential meetings at the upcoming Halifax conference. (Marco)

Appendix IV - BCA Meeting Notes

International Research Collaboration Phase 2 - Leveraging Technology by Valuation Agencies in Canada

Interview with BC Assessment (BCA), Canada

Date: 1 Aug 2025 (Thu)
Time: 7:30am [Canada] / 3:30pm [UK] / 4:30pm [Netherland] / 10:30pm [HK]
Present:

Mike Spatharakis (BCA)	George Anderson (VOA)
Marco Kuijper (Waarderingskamer)	Anita Ng (RVD)
Vincent Lai (RVD)	Michael Yau (RVD)
Michael Choi (RVD)	

Interview notes:

Data Collection Methods: Mike explained BCA's data collection methods, including the use of building permits, sales reviews, imagery products, fieldwork, and development plans for updating property inventory and valuations.

- **Building Permits:** BCA uses building permits issued by the permitting authority to trigger maintenance and updates for physical data.
- **Review of sales**: BCA reviews sales to identify physical changes not previously captured.
- **Data Maintenance Program:** BCA has a data maintenance program for residential properties that involves analytical sampling to test the accuracy of their physical inventory. Data collectors are sent into the field with blank field cards to re-inventory properties, and the results are compared to the systemised data to identify inventory issues.
- **Imagery Products:** BCA primarily uses aerial and satellite imagery products for existing inventory. They are integrated with Eagle View and various products, including change detection, ortho imagery, oblique imagery, and street front imagery, for data maintenance projects.
- **New Construction and GIS Exploration:** Fieldwork for physical data collection is mainly conducted for new construction and major alterations to properties. BCA is also exploring the use of geographic information system attribute data to identify physical property features not previously collected.
- **Development Plans:** BCA reviews development-based plans, especially for larger mixed residential and non-residential projects or multifamily residential projects, to get early indications of changes in highest and best use, which can affect property valuations.

Legislative Requirements and Information Sharing: Mike discussed the legislative requirements for accessing records from civic governments and the use of electronic means for information sharing, noting variations in frequency and completeness.

- **Legislative Access:** BCA has a legislative requirement to access records from civic governments for assessment purposes. The act entitles BCA to request information needed for assessments, although civic governments are not compelled to provide it.
- **Electronic Sharing:** BCA uses Citrix Sharefile for electronic information sharing, where each civic government has a secured folder to upload information. Additionally, some information is received via email.
- **Information Frequency:** The frequency of information provided by civic governments varies, with some providing it monthly, weekly, or ad hoc, depending on their size and resources. Smaller governments may have less frequent and complete information sharing.
- **Data Capture Solution:** BCA is working on a data capture solution to implement more application programming interfaces for electronic data transmission, aiming to build more data feeds and allow submission of electronic forms that integrate with their system.

Property Owner Compliance: George and Mike discussed the onus on BCA to stay updated with property changes, with BCA sending out directed information requests to property owners. Response rates are higher for residential properties compared to non-residential ones.

- **Information Requests:** BCA sends directed information requests or questionnaires to property owners as part of their data maintenance program. These requests ask property owners to confirm inventory and report any additions, alterations, or demolitions.
- **Response Rates:** Response rates for these information requests are about 70% for residential properties and around 30% for non-residential properties. Non-residential property owners are more reluctant to provide information due to potential impacts on assessed values.

Energy Efficiency Data Collection: Marco Kuijper asked about collecting energy efficiency data, and Mike acknowledged it as a gap they want to fill, including exploration of tools and government data sources.

- **Current Gap:** BCA currently does not collect energy efficiency data, such as information on solar arrays or energy efficiency levels of houses. This is identified as a gap they want to address.
- **Exploration of Tools:** BCA is exploring tools for picking up solar arrays and acquiring data from provincial and federal government grant programs. They aim to analyse the potential value impacts of energy efficiency features as part of their modelling process.

Efficiency of Data Entry: George and Mike discussed the efficiency gains from eliminating manual data entry through electronic forms, data feeds, and validation rules.

- **Time Savings:** BCA has analysed a couple of forms and found that eliminating manual data entry could save 15-35% of time, depending on the complexity of the form and the amount of data validation required.
- **Validation Rules:** Implementing rules-based validation to electronic forms can further improve time savings by reducing the need for staff to review and validate data before committing it to the system.
- **Data Feeds:** BCA has automated data feeds from the land title and survey authority, which currently process about 25% of the data automatically, saving around six to seven full-time equivalent administrative resources.
- **Future Goals:** BCA aims to expand data feeds and implement more application programming interfaces to allow electronic data transmission, reducing manual data entry and improving efficiency.

AI and Technology Advancements: George and Mike discussed BCA's exploration of AI, machine learning, and automation for feature extraction, data entry, and data collection.

- **AI Exploration:** BCA is exploring AI and machine learning for feature extraction from imagery and geographic information systems. This includes predictive modelling for mapping-based feature information and extraction.
- **Automation:** BCA is looking at automation for data entry, such as automating data feeds from the land title office and the manufactured home registry, to reduce manual data entry and improve efficiency.
- **Application Programming Interfaces:** BCA is leveraging application programming interfaces for data collection, aiming to bring in more data on mass and eliminate the need for manual data entry from reliable sources of information.

Training and Upskilling Workforce: George and Mike discussed the importance of training and upskilling the workforce to keep up with technology advancements, including specific training programmes and industry collaboration.

- **Centralised Team Training:** BCA recently trained their centralised modelling team, data scientists, and assessment analysts on predictive modelling approaches, including geographic weighted regression and gradient boosted machines, to enhance their skills and knowledge.
- **Valuation Team Training:** BCA is working on training their valuation teams to prepare them for significant shifts in modelling approaches. This includes showing them exploration results and preparing them for the implementation of new model types within the next year or two.
- **Operational Training:** BCA is focusing on operational training to contextualise the training in their environment with their tools and processes. This is critical for the successful implementation of new modelling approaches and reducing change resistance.
- **Industry Collaboration:** BCA recognises the need for collaboration across the industry to modernise educational programmes and train appraisers for future requirements. This includes working with post-secondary institutions to update their content and programmes.

Challenges of Annual Revaluation: Marco Kuijper asked about the challenges of implementing new technologies with annual revaluation, and Mike explained the need for multi-year strategies and segment-by-segment approaches.

- **Implementation Strategies:** BCA needs multi-year implementation strategies to manage the constraints of annual reassessment. This involves deciding on methods, integrating them into the system, and training valuation teams on new processes within a limited timeframe.
- **Segment-by-Segment Approach:** For non-residential properties, BCA is considering a segment-by-segment approach, implementing modelling subtype by subtype year by year, to manage the constraints of annual reassessment more effectively.

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Interview Questions

Organization: BC Assessment
Date: July 30, 2025.
Respondent:
Michael Spatharakis MPA, AACI, P. App.
Director, Mass Appraisal Standards & Solutions
michael.spatharakis@bcassessment.ca

Data Collection (Physical & Transaction Data)	Data analytics, valuation & quality check	Notification
Question: What types of modern technology valuation agencies are currently using?		
Physical Data: Ortho and oblique aerial and high-resolution street-front imagery (residential properties), public satellite imagery (identify properties requiring inspection for new improvements), electronic information (e.g., building permits, building plans, development applications and approvals, land use control amendments, etc.) from civic governments, electronic plans/drawings, field data collection devices (tablets), local, provincial, and federal government GIS applications, and real estate listings. **Transaction Data:** Data feed from BC Land Title and Survey Authority, access to real estate board multiple listing service (MLS) applications, Manufactured Home Registry reports, and civic, provincial, and Indigenous government rental agreements. We also follow-up with parties to property transfer and rental agreements, where necessary, to clarify transaction data.	**Data Analytics Applications:** Microsoft SSRS, SSIS, PowerBI, and Excel, and RStudio. **Valuation (CAMA):** Tyler Technologies Enterprise Assessment and Tax (standard/on-premises edition). **Valuation (Predictive Modelling):** R-Studio, R-Shiny, and PowerBI dashboards.	Interactive website with interactive reporting and web applications for property owners and civic governments to access annual assessment roll information (Note: Further details are provided below on products and services by stakeholder type).

Data Collection (Physical & Transaction Data)	Data analytics, valuation & quality check	Notification
Self-reporting by property owners and representatives via online forms (Note: Presently, the data collected via online forms requires manual entry by staff into our CAMA system; however, as noted below, we are exploring form integration to eliminate manual data entry).		
Question: What types of modern technology valuation agencies are planning to use over the next 3 years?		
Expanded use of application programming interfaces (APIs) and electronic (smart) forms to consume data from reliable sources (e.g., government agencies, property owners, property managers, and authorized agents). Exploration of imagery and GIS-based physical data (feature) extraction.	**Valuation (Predictive Modelling):** Exploring different types of regression and machine learning models for use with Residential properties, and for planning and forecasting work. Exploring use of GIS technology to verify property attributes.	Newer version of SharePoint, modern authentication management, and expanded use of application programming interfaces (APIs) to enable enhanced notification via web presence.
Question: How are valuation agencies using modern technology to re-engineer their current business processes?		
Imagery change-detection software to trigger physical data collection. Increased utilization of automated data collection and integration to reduce manual data entry.	AI-assisted workflows to augment staff ability, e.g., automated comparable sales, natural language processing on permits, and scripted data validation and audit correction to reduce data quality errors.	Better web-based tools enable reduction of paper-based notification and information sharing with external stakeholders, and reduction in manual data entry for two-way information exchange.
Question: Which business processes have been improved with the implementation of modern technology?		
More efficient collection and maintenance of physical data by using statistical sampling and imagery.	**Mass Appraisal Process (Residential Property Valuation):** model specification and calibration and appraisal review and validation of assessed values have improved greatly with implementation of	**Property Owners:** Few inquiries received about changes in assessments, as equity and market value information is more readily available. Furthermore, when inquiries are

Data Collection (Physical & Transaction Data)	Data analytics, valuation & quality check	Notification
Automated processing of approximately 25% of weekly transaction data obtained via data feed from BC Land Title and Survey Authority.	predictive modelling and a structured mass appraisal process with defined process phase (including processes, tools, and desired outputs). **Roll Quality:** Fewer audit hits are recorded, reducing manual audit correction efforts of field staff.	received, discussions are often more robust, and property owners are better informed by publicly available information. **Taxing Authorities:** Fewer inquiries on assessment roll data given self-serve reporting options.
Question: How valuation agencies are utilizing modern technology to communicate with their stakeholders?		
Creation electronic forms and APIs to enable collection and consumption of electronic data.	Mass Appraisal Process (Residential Property Valuation): Better analytics tools and predictive modelling output has increased transparency for and capability of appraisal teams to complete their review and validation activities, thereby, improving assessment roll quality.	Interactive website service (Assessment Search), enabling comparison of property assessments and sold properties for confirmation of equity and level of assessment. Posting of PDF assessment notices on website during January inquiry period. Posting of property information and trends (for annual roll) on website, e.g., annual assessment roll news releases, top 500 highest value residential properties, interactive market trends by property class map, etc. Authenticated taxing authority website portal for retrieval of annual assessment roll data files (importable into taxation software), self-serve assessment roll reporting, and submission of electronic information (e.g., building permits, building plans, land use control amendments, taxation exemptions, etc.).

Data Collection (Physical & Transaction Data)	Data analytics, valuation & quality check	Notification
Question: What modern technology are valuation agencies finding most effective in supporting and improving their interactions with stakeholders?		
	Data analytics applications (e.g., Microsoft SSRS, SSIS, PowerBI, and Excel, and R-Studio) have improve ability to efficiently and effectively share data and analysis with valuation teams and external stakeholders.	Interactive website.
Note: For review valuation (formal & informal steps), see responses for data collection and analytics, valuation, and quality control section		

Appendix V - PVSC Meeting Notes

International Research Collaboration Phase 2 - Leveraging Technology by Valuation Agencies in Canada

Interview with Property Valuation Services Corporation (PVSC), Canada

Date: 6 Aug 2025 (Wed)
Time: 7:30am [Canada] / 12:30pm [UK] / 1:30pm [Netherland] / 7:30pm [HK]
Present:

Rebecca Vorstermans (PVSC)
Jamie Murphy (PVSC)
Marco Kuijper (Waarderingskamer)
Vincent Lai (RVD)
Michael Choi (RVD)
Jeff Caddell (PVSC)
George Anderson (VOA)
Anita Ng (RVD)
Michael Yau (RVD)

Interview Notes:

Data Collection Technologies: Anita, Rebecca, Jamie, and Jeff discussed the modern technologies used for data collection in their jurisdiction, focusing on mobile applications and field data collection methods.

- **Mobile Assessor Application**: Jamie explained the use of a mobile software app called Mobile Assessor from Data Cloud Solutions, which allows assessors to input data in the field using iPads. The data is then reviewed and approved before being uploaded to the Tyler Technologies system.
- **Data Review Process**: Jamie mentioned that the data collected using the Mobile Assessor app is reviewed for quality before being uploaded. The assistant director can either review the data individually or bulk approve it, ensuring accuracy before it is integrated into the Tyler Technologies system.
- **API Integration**: Jamie highlighted that an API connects the Mobile Assessor app to the Tyler Technologies system, allowing for seamless data transfer and updates. Once the data is approved, it is automatically uploaded to the Tyler system, where assessors can review any changes.

Pictometry Services: Jamie and Rebecca elaborated on the use of advanced imagery technologies for remote property assessment and monitoring development changes.

- **High-Resolution Imagery Capture:** Jamie explained that Eagle View's pictometry services capture high-resolution imagery, either 15 cm or 7.5 cm, depending on the area. This imagery is used to monitor changes in development across the province.
- **System Integration:** Jamie mentioned that the imagery captured by Eagle View is integrated into the Tyler Technologies system. This allows assessors to view changes in development remotely, with overlays of parcels and other relevant data.

- **Regular Updates:** Jamie stated that large urban areas are generally flown every two years to ensure up-to-date imagery. This regular capture of imagery helps maintain accurate records of development changes.

Internal Data Collection: Anita inquired about the collection of internal data, such as partitioning and structural alterations, and the systems used for data storage and management.

- **Data Storage Systems:** Jamie explained that most internal data is stored within the Tyler software, with some offline storage through Microsoft OneDrive. This ensures that data is securely stored and easily accessible for review and analysis.
- **Sales Information Management:** Rebecca mentioned that sales information is collected nightly from the province and reviewed to update property records. This helps ensure that the data is accurate and up-to-date.
- **Commercial Property Financial Data:** Rebecca added that financial data from commercial properties is collected through mail-out requests and online tools. Property owners can also call the internal contact centre to provide updates, ensuring comprehensive data collection.

Web Portal for Property Owners: Discussion about digital platforms for property owner interaction and information sharing.

- **My Property Report Platform:** Rebecca mentioned that they have a platform called My Property Report, where property owners can log in and see detailed information about their property. However, there is currently no online way for them to provide updates, and they must call or email to submit changes.

Data Analytics and Machine Learning: Jeff explained the implementation of advanced analytical tools and machine learning technologies for property valuation processes.

- **Machine Learning Implementation:** Jeff explained that machine learning tools are used to value residential properties. The data is cleansed and prepared for the model using R, and multiple models are used to validate the results, ensuring accuracy and stability of values.
- **Data Preparation:** Jeff mentioned that the data is cleansed and prepared for the model using R. This process involves identifying and addressing data anomalies to ensure the accuracy of the model's predictions.
- **Sales Comparable Tool:** Jeff highlighted that assessors can use a sales comparable tool to assist in making value decisions. This tool returns up to 10 comparable properties based on various criteria, helping assessors validate the machine learning values.

Spatial Analytics: Anita inquired about the use of spatial analytics and geographic factors in property valuation.

- **Spatial Attributes Integration:** Jeff mentioned that they are interested in incorporating more spatial attributes into their model and provide insights to the valuation team on how properties are impacted by certain amenities and geographic factors.

Communication with Property Owners: Marco asked about the challenges of explaining machine learning valuations to property owners and maintaining transparency.

- **Market Evidence Communication:** Jeff and Rebecca emphasised the importance of using market evidence to explain machine learning valuations to property owners. This helps property owners understand the basis of their property values.
- **Clear Language Usage:** Rebecca highlighted the need to use clear language when communicating with property owners. Instead of technical terms like "machine learning" or "AI," they use terms like "advanced statistical analysis" to make the concepts more understandable.
- **Human Validation:** Jeff and Rebecca stressed the importance of human validation and quality checks to ensure accurate values. This reassures property owners that the valuations are not solely based on automated processes.

Customer Service and Inquiry Management: George and Rebecca discussed the importance of balancing technology and personal touch in customer service delivery.

- **Property Owner Inquiry Standards:** Rebecca mentioned that they have property owner inquiry standards that require assessors to pick up the phone if an issue is not resolved after two email exchanges.

Technology and Business Process Reengineering: Anita asked about the use of technology to reengineer business processes and improve operational efficiency.

- **Identifying Pain Points:** Rebecca mentioned that they are focusing on identifying pain points in their internal processes and exploring opportunities for streamlining and efficiency through AI and automation.
- **Innovation Portfolio:** Rebecca explained that they are considering starting an innovation portfolio where staff can propose ideas for reengineering business processes. These ideas will be evaluated for feasibility and potential benefits.
- **Digitisation of Workflows:** Rebecca stated that they are considering the digitisation of workflows to improve efficiency. This includes better utilisation of their website for service delivery and potentially delivering assessment notices through digital means.

Stakeholder Communication: Anita inquired about communication strategies with major stakeholders including municipalities and real estate agents.

- **Personal Touch Approach:** Rebecca and Jamie explained that personal touch is important for communication with stakeholders, such as municipalities and real estate agents. They use secure FTP sites for file sharing and prefer one-on-one conversations for resolving issues.

Efficiency Improvements through Technology: Discussion about measurable improvements in operational efficiency due to technology implementation.

- **Resource Optimization:** Jeff provided examples of how technology has allowed them to resource appropriately, conduct field visits remotely, and identify market trends.
- **Reassessment Time Reduction:** Rebecca highlighted the reduction in reassessment time from several months to a few weeks due to the use of modelling.

Appeal Process and Technology: George asked about the integration of technology in the appeal process and case management.

- **Data Science Tools for Appeals:** Jeff and Jamie explained that assessors handle appeals and use data science tools to prioritise and expedite appeals based on certain criteria. This allows them to move through appeals quickly and efficiently.

Training and Upskilling Staff: George inquired about training and upskilling staff to keep up with technological advancements.

- **Soft Skills and Continuous Learning:** Rebecca and Jamie emphasised the importance of soft skills, continuous learning, and trust in the organisation. They also highlighted the need for a culture that is accepting of technology and adaptable to new processes.

Alternative Work Schedule and Technology: Marco asked about the introduction of the alternative work schedule and its relationship to technology adoption.

- **Technology-Enabled Efficiency:** Rebecca and Jamie explained that technology played a significant role in enabling the alternative work schedule by increasing efficiency and reducing stress. However, they also emphasised the importance of a culture of continuous improvement and adaptability.

Follow-up Tasks:

- **Sharing Inquiry Standards:** Send the property owner inquiry standards to George for reference and possible implementation. (Rebecca)
- **Follow-Up on Gaps in Discussion:** Reach out to Rebecca if there are any gaps in the conversation that need to be filled after the meeting. (the team)

Focus Group Number 2
Business Process Modernization:
USA

Group Members:

- Terry Samson (MPAC)
- Ayoub Chouraichi (PVSC)

Executive Summary

The conclusion from this research is clear: modernization of assessment processes and administration is necessary, feasible, and already underway in many assessment jurisdictions. The successful path forward is to begin research immediately, prioritize areas of greatest inefficiency, and implement changes incrementally using an agile structure. By following this approach, jurisdictions can achieve meaningful efficiency gains, improve accuracy of data and valuation models, and create more equitable assessment systems over time.

The study emphasizes the necessity of a modernization strategy that is both structured and flexible. Areas should focus on the worst risks and inefficiencies rather than attempting to change everything at once. They can successfully implement long-lasting technological changes by employing focused actions. Modernization efforts can remain adaptable to new challenges, evolving laws, and the introduction of new technologies thanks to this methodical approach. Additionally, it promotes collaboration amongst departments and stakeholders, facilitating continuous learning and enhancements throughout the implementation process.

In addition, modernization presents a valuable opportunity to strengthen public trust and accountability. By improving data accuracy, process transparency, and turnaround times, assessment organizations can enhance stakeholder confidence in the fairness and equity of property valuation systems. Modern tools also allow for better communication with taxpayers, providing accessible information and faster issue resolution, which are key elements in maintaining credibility and engagement in an increasingly digital society.

To sum up, modernization is not simply a technological upgrade but a strategic transformation of how property assessments are conducted and managed. The jurisdictions that act now through research initiation, investing in scalable solutions, and fostering a culture of continuous improvement will be best positioned to achieve sustainable operational excellence. In the long term, these efforts will bring tangible benefits: more accurate assessments, higher efficiency, and a more equitable system that better serves both governments and the communities they support.

Introduction

Background on U.S. Property Valuation

Property Valuation in the U.S. supports local governments financially through taxation service delivery. However, foundational property valuation systems are under pressure due to increasing demand for property valuation services. As markets grow, so do expectations for transparency, efficiency and accuracy. Jurisdictions face high levels of pressure for technology modernization adoption within valuation and assessment systems. As highly recommended by the International Property Tax Institute (IPTI), it is very important for jurisdictions to strive for fair, efficient, and technology-enabled tax systems[1].

In the past few years, the interest in adopting sophisticated digital tools and data-driven systems within property valuation and tax administration has significantly increased. Since the Covid-19 pandemic, jurisdictions in the U.S. have felt the need to shift their traditional valuation approach to more digital and automated valuation models (AMVs). Other tools and systems include Geospatial

Artificial Intelligence (GeoAI), Machine Learning Analytics, and mobile inspection platforms that reshaped the process of data collection.

The shift from a traditional valuation method to a modern approach comes with several challenges. The transition can only be fully successful if both efforts and infrastructure are aligned. For instance, data ecosystems are supposed to be accurate and complete before integrating AI and machine learning models. The Urban Institute, a research organization, confirms that "the appraisal process is continuously showing room for improvement despite how critically accurate valuations are"[2]. Technology adoption is not a one-time upgrade to valuation systems and models, but rather a continuous improvement to data quality, governance, and transparency.

This report summarizes the research conducted in order to understand the benefits to adopting technology modernization in property valuation in the U.S., as well as the multi-dimensional challenges that jurisdictions face. The research was focused on reviewing five different white papers, presentations, and/or reports for technology adoption for different jurisdictions, as well as valuable information collected through interviewing the Chief Operations Officer, Mirella Villafuerte from Cook County, Illinois.

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[1]*About Us. (n.d.).* https://www.ipti.org/about-us

[2]*McCargo, A. (2025, July 15). Modernizing home appraisals would advance accuracy, transparency, and equity. Urban Institute.* https://www.urban.org/urban-wire/modernizing-home-appraisals-would-advance-accuracy-transparency-and-equity

Literature/Document Review

1. Maricopa County Assessor's Office – Residential Desktop Recanvassing Project

It is clear from the research undertaken in Maricopa County, which is in the state of Arizona, that many challenges exist when it comes to maintaining accurate and up-to-date property data. The county is home to four million residents, which makes it the fourth most populated county in the United States, with over 1.2 million residential properties around the Phoenix area. The size of the jurisdiction makes traditional canvassing for data collection difficult to sustain, and many older neighborhoods have not been revisited in decades. As a result, important structure data isn't always collected and therefore shortchanging the county of tax revenue.

In response to this challenge, the Maricopa County Assessor's Office tested a pilot program to explore alternatives to "boots on the ground" data collection. The county turned to GIS technology to increase efficiency and accuracy, selecting Assessment Analyst, a product developed by Esri. The purpose was to test whether desktop recanvassing could replace boots on the ground as a viable and scalable way of updating property data while reducing cost.

The research demonstrated that using Assessment Analyst allowed the county to integrate aerial and street photography into the property review/data collection process. This approach allowed staff to verify property addresses, revise building sketches, and directly update their CAMA system. Where photo evidence was missing or not of high quality, a property could be flagged for an on-site inspection.

The benefits of this case study titled "Maricopa County Generates a More Equitable Tax Roll with Assessment Analyst" were:

- The taxable value of the county's residential property base increased by an estimated $1 billion due to the identification of previously unrecorded property features.
- The project achieved a 10:1 return on investment by its fourth phase.
- Staff now process approximately 100,000 property data reviews annually, with fewer than 0.5% requiring on-site visits.
- Operational costs were reduced, including savings on fuel, vehicle maintenance, and travel time.
- Improved data accuracy has reduced statistical errors and built greater confidence in property valuation models.

The impact of these outcomes is clear; by creating a more equitable and accurate tax roll, the county has increased the fairness of its property tax system while improving efficiency. The project also demonstrates how technology can modernize a business process without sacrificing quality.

Recognition of the project's success has been significant. The Maricopa County Assessor's Office received both the National Association of Counties' Achievement Award and the Arizona Association of Counties' Summit Award for its leadership in adopting Residential Desktop Recanvassing tools. These awards underline the importance of studying new methods to modernize existing assessment processes.

This research shows that modernizing assessment practices is not only about improving efficiency, but also about accuracy and equity. By embracing GIS technology, Maricopa County has taken steps

to ensure its tax base reflects the actual character of its properties, and that taxpayers are treated fairly and equitably.

2. City of Philadelphia - Enterprise GIS and Data Collection Using AI and ML

It is clear from the work undertaken by Brian Ivey and Philip Daniel from the City of Philadelphia that the use of artificial intelligence (AI) and machine learning (ML) has the potential to improve efficiency and accuracy during initial data collection and data maintenance. The City's Office of Property Assessment (OPA) has completed a project to automate a citywide update of building square footage and property sketches building on the digital solutions and the geographic information system (GIS) system that they have in place. The work described here was presented by Brian Ivey and Philip Daniel under the title "City of Philadelphia Enterprise GIS and Data Collection Using AI and ML".
Given the vast number of properties in the jurisdiction, some properties have not been verified in years, and until recently OPA did not have a viable way to create and store sketches within its Computer-Assisted Mass Appraisal (CAMA) system.

Square footage data directly impacts property assessment, as it's a major variable influencing value and thus plays a major role in properties assessment. OPA is modernizing its assessment processes by combining aerial imagery, lidar data, oblique photos, and geospatial datasets to construct the data from which AI models can predict square footage and generate floorplan sketches.

Several advanced tools are used for this initiative, including ArcGIS Pro, Image Analyst, deep learning tools, and the Segment Anything Model (SAM) developed by Meta AI. SAM is being trained alongside a pre-existing building footprint model to refine outlines, correct distortions, and address common issues such as missing or duplicated buildings, gaps between row houses, and features like driveways being misclassified as structures. By also using lidar data, they are able to build 3D models that can estimate the number of floors based on height and therefore calculate square footage of the structure.

The results to date demonstrate steady progress:

- Of Philadelphia's 31 project zones, nine have been completed.
- 19 are in progress.
- 3 remain to be started.
- Nearly 34,000 buildings have been processed, with 85% confidence in the square footage calculations.
- Over 8,000 buildings have been flagged for further review by staff.
- A mapping application built on Esri's web app framework provides an accessible interface for reviewing results, with options to search properties and view ortho imagery.

This research shows that even partial success can provide significant benefits. OPA staff note that if only 60% of square footage entries are successfully updated through this project, the city will save significant time and money by reducing manual fieldwork. This efficiency gain and the production of sketches for integration into the CAMA system, positions the City to improve both the accuracy and transparency of its property data.

This initiative illustrates how the integration of AI, ML, and GIS can modernize the processes used in property assessment. This research underscores that modern technology can greatly improve efficiency when applied correctly with user input which will result in improved accuracy in property records.

3. Interpretable AI: Moving Beyond Least-Squares Regression Without the Black Box

While ordinary least squares (OLS) regression is the popular method of statistical modeling for many assessment jurisdictions, due to its simplicity and transparency, it has significant limitations in addressing nonlinear relationships. OLS regression approaches are linear and interpretable, but they often fail to capture non-linear complex relationships. More advanced methods of modeling are emerging out of the AI space; specific examples are non-parametric artificial intelligence (AI) methods such as gradient boosting. The one major drawback to AI models is their complexity, especially in terms of explainability, as many of these advanced modeling techniques have the "black box" problem.

The work reviewed here, which was performed and presented by Joseph Wehrli from Tyler Technologies titled "Interpretable artificial intelligence: Moving beyond least-squares regression without the black box", highlights emerging models that bridge the gap between traditional regression and advanced AI. These include AI approaches such as Mixed Integer Linear Programming (MILP) and Constraint Programming (CP), as well as Generalized Regression Neural Network (GRNN). Together, these approaches offer a path towards models that are both flexible and interpretable, supporting valuation practices that require accuracy, transparency, and equity.

OLS remains valued for its linearity, clarity, and accessibility through common platforms such as Excel, SPSS, R, and Python. Its additive and multiplicative properties make it a logical fit for appraisal theory and compliance-based modeling. These OLS techniques, however, are constrained by their linear assumptions.

Modern modeling toolkits/libraries in Python such as statsmodels and scikit-learn combined with coding environments like Jupyter notebook expand the toolkit available to analysts. AI models such as gradient boosting (XGBoost, LightGBM, CatBoost) are highly effective at handling complex, non-linear data by iteratively correcting errors through tree-based decisions. However, without additional methods, these AI techniques are not inherently interpretable.

To address the issue of interpretability, analysts can employ interpretability tools such as:

- SHAP values, which show the per-feature contribution to each prediction.
- Partial dependence plots, which display average marginal effects across features.

These tools allow analysts to display and explain the contribution of value that the model features are contributing and, in turn, removing the "black box" problem.

Research into AI modeling for valuation modeling still has areas to improve in terms of simplicity of interpretability; however, the advancements that have been made are promising and future modeling techniques will most likely be a combination of traditional regression and advanced AI models that support transparency.

4. Riverside County – Boosting Appraiser Efficiency with Enterprise AI and Machine Learning

Riverside County, California, with a population of 2.5 million and an assessment roll of $369 billion across one million parcels for 2022, faces the challenge of producing efficient and equitable valuation processes under California's Propositions 13 and 8. In 2022, the Assessor's Office processed 156,000 re-assessable events, including 92,000 transfers, 52,000 Proposition 8 cases, and 12,000 new construction events.

The traditional process for determining direct enrollment at sale price vs manual appraisal is complex and was a slow manual process, thus making it an ideal process to try and find new approaches that could improve efficiency while also improving fairness and consistency.

To address these challenges, Riverside County deployed C3 AI Residential Property Appraisal, an enterprise AI and machine learning platform. Sohaib Shaikh and Amit Berry from C3 AI and Chris Gray from Riverside County presented "Boosting appraiser efficiency with enterprise AI and machine learning" at the URISA GIS Valuation Conference in 2023. The system integrates continuous data processing, model development, model application and governance into one environment, hosted on Google Cloud. Appraisers, supervisors, and technicians now have access to streamlined workflows with real-time predictions and monitoring tools aligned with IAAO standards.

The initiative also trained Riverside County staff in the C3 AI Integrated Development Studio, enabling them to manage the full model lifecycle: preparing data, selecting features, training pipelines, deploying models, tracking feature importance, and incorporating business feedback. This platform reduced development time and improved confidence in the results while making the appraisal process more agile and transparent.

Key benefits of this AI implementation include:

- Simplicity as fewer models are needed with less calibration effort.
- Flexibility in terms of incorporating more data sources and broader event coverage, including zero-sale transfers.
- Efficiency in automation of direct enrollment and Proposition 8 reviews, reducing manual workload.
- Quality control as early detection of invalid sales prices minimizes post-processing cleanup.
- By adopting enterprise AI and machine learning, Riverside County has demonstrated how assessment jurisdictions can increase efficiency and quality by incorporating modern AI into its business processes.

5. Catch the AI Wave: Demystifying AI-Powered Property Valuation

There has been significant growth when it comes to implementing artificial intelligence (AI) and machine learning (ML) in property valuation in the U.S. One thing that Data Scientists can agree on is that developing a machine learning model or using sophisticated AI tools can be both complicated and time consuming. Nonetheless, the time and resources spent on creating the right ML model can be very efficient. On one hand, it reduces the time spent on property valuation, mass appraisal and analytics. On the other hand, AI-drivel models provide accuracy and consistency within property assessments and data quality. This document provides best case practices from Riverside County, California, and Stark County, Ohio that showcase how AI integration impacts property assessment workflows.

The cases studies explain the fundamentals of AI and how it works in interesting metaphors. For instance, if humans can make mistakes, so do AI models. However, humans can learn from their mistakes and experiences in order to improve their decision-making. AI models use the same approach by learning from data. The more accurate and reliable the data quality is, the more performing AI models can be. When we apply this concept to appraisal, AI models gain training and experience from thousands of sales and property characteristics before predicting market values for both residential and commercial properties. C3 AI summarizes AI models' key advantages in enhancing accuracy through data-driven models and increasing operational efficiency through valuation or appraisal process automation.

The report emphasizes that trust is a key component for stakeholders and the public when it comes to AI. The most efficient way to build that trust is to provide details and explanations on how the AI model is built, what characteristics were taken into consideration, and the level of accuracy and data quality relied on to predict property and market values. The method that C3 AI uses to demonstrate how to clarify model outputs to stakeholders and the public is by highlighting feature contributions and sales comparable analysis. Every model feature is perceived as an ingredient that influences the outcome, whether it is lot size, condition, renovations etc. Each component plays a role in determining the final valuation. C3 AI has a system in place called "Evidence Package", it displays all the features that contributed to the final valuation. It allows assessors to track the process from raw data to precited market values, while ensuring that everything is aligned with the IAAO standards for integrity.

The document focuses also on how AI can be used for imagery and GIS systems. AI models and algorithms allow assessors to analyze images in order to identify different attributes (flooring, condition, quality, etc.) using what they call Convolutional Neural Networks (CNNs) and heatmaps to determine visual features that can directly influence valuation outcome. C3 AI highlights the importance of reliability of these algorithms. Assessors use Generative AI to analyze data using natural language queries that help them maintain data quality and limit risk for imagery errors.

Two different jurisdictions adopted C3 AI's property appraisal system, and the results were remarkable. Riverside County, California, implemented C3 AI's property appraisal system to address different challenges such as increasing workload pressure and staffing. Within six months, Riverside County, California:

- Achieved 75% improvement in appraisal efficiency.
- Reduced the number of models maintained by 8 times.
- Realized 42% higher model accuracy compared to its previous system.

Similar results have been achieved by Stark County, Ohio:

- Reported a 34% increase in valuation model accuracy.
- 20% improvement in coefficient of dispersion.
- Reduction in data processing time from four days to one hour.

These two counties demonstrate that AI can both scale appraisal operations and enhance fairness and confidence in assessed values.

The report emphasizes that AI models used for valuation are not about replacing professional and accurate judgment. They are considered analytical tools to guide assessors for better judgment. There are several key components that lead to a successful implementation:

- High-quality data.
- Continuous model training.
- Strong governance frameworks.

Incorporating AI into traditional valuation workflows and jurisdictions allows us to achieve significant efficiency gains, maintain integrity, and support more equitable property assessment systems. It is clear that AI plays a major role in modernizing the property valuation industry through scalable, interpretable, and data-driven methodologies that maintain both efficiency and fairness.

Case Input: Cook County, Illinois

Introduction

Cook County, Illinois, is home to one of the largest property tax systems in the US. The Cook County Assessor's Office is responsible for assessing over 1.8 million parcels of property and delivering an effective and equitable property tax process. Given the scale and complexity of such tasks, modernization of technology systems has been a pressing priority. Following a discussion with the Chief Operating Officer of the Assessor's Office, the research team acquired insights on the Integrative Property Tax System Project - a priority project to replace the Legacy system, which has been running for decades, with a newer, more integrated system.

Project Background and Objectives

The Integrative Property Tax System Project was initiated more than a decade ago with the goal to substitute a decades-old mainframe system. The aging infrastructure had been used for many years by the Assessor's Office, Clerk, and Treasurer, and was overseen by the Bureau of Technology. It needed to be modernized to enhance efficiency, data quality, and bring the property valuation practice up to legislative standards. The project required large-scale organizational change management, as new technology and automated processes would significantly affect long-standing workflows.

Challenges in Implementation

Staff and stakeholder resistance to change was perhaps the biggest challenge encountered. Concerns were raised that process automation would reduce staffing capacity and affect job security. Implementation consultants were tasked with overcoming this resistance by developing new methods of keeping employees engaged and interested in the new system. Despite initial resistance, the project was successfully able to migrate operations from the Legacy system to the new application, with the first part of the system going live 18 months later.

Key Features and Enhancements

One of the features of the modernization project was the development of an online appeals application. While previously appeals could only be filed in person or by mail, and the system was limited to residential property, the new application introduced functionality to cover all types of property and allowed taxpayers to file appeals, upload supporting documents, and track paperwork entirely online. While initially met with skepticism, the system quickly proved its value when the COVID-19 pandemic required remote operations. The online platform enabled continuity of service, minimized risks of lost documents, and accelerated the appeals process by providing taxpayers with quicker responses.

Cook County’s property inspection activities are supported through Field Mobile, a component of the Tyler Technologies product suite. This mobile application enables field staff to conduct inspections efficiently, capture real-time property data, and synchronize updates directly with the county’s core assessment system. The integration of Field Mobile within the Tyler ecosystem ensures data consistency, improved workflow automation, and reduced manual entry errors across field operations.

The SmartFile portal (also part of the Tyler Technologies iasWorld platform) serves as Cook County's centralized public interface for a range of property-related filings. The portal enables residents to complete the entire appeals process online, from reviewing property data to submitting documentation and tracking appeal status. Beyond appeals, SmartFile consolidates several key services under one digital platform:

- **Online Appeals:** Residents can file appeals across multiple property types, including residential, commercial, condominium/cooperative, vacant land, incentive, omitted assessment, and secondary attachment appeals.
- **Homestead Exemptions:** The portal supports first-time homestead applications and renewals for Senior Freeze and Disabled Veteran exemptions (introduced for the 2024 tax year, payable in 2025). It also enables retroactive applications for missing exemptions through the Certificate of Error process.
- **Building Permit Filings:** Both suburban and City of Chicago building permits can be filed through the system by municipalities and township assessors.
- **Miscellaneous Filings:** Includes annual exempt affidavits for tax-exempt agencies and residential property characteristic updates submitted directly by taxpayers.

Improving Data Quality and Efficiency

The modernization effort also concentrated on data migration and improvement. Efforts were directed at migrating data from the Legacy system to the new application without compromising data quality and usability for property valuation models. Management believes that field inspections should continue as they are very reliable because they provide greater accuracy than relying on the use of automation tools alone. With the integration of digital systems, analysis of data and reviews are now significantly faster and more efficient, and operations are more streamlined, and less paper based.

Continuous Improvement and Future Opportunities

The modernization initiative demonstrated that stakeholder and staff input is precious in guiding future steps and encouraging continuous improvement. The Assessor's Office views modernization as an ongoing process rather than a one-time implementation. There is potential for developing additional applications for improving public-private sector interactions more effectively, which will continue to drive the efficiency and transparency of Cook County's property tax system. By combining automation and human expertise, the County is positioning itself for stronger, more responsive property valuation in the years ahead.

Patterns and Trends Across All Findings

A review and analysis of all findings provide clear and consistently visible patterns across jurisdictions related to the modernization of property valuation systems. All projects are different, with their own context and scope, yet the emerging themes indicate a broad shift across the U.S. towards data-driven assessment practices that are efficient and equitable. The evolving workforce, implementation of technology, and valuation processes are at the heart of these changes, resulting in measurable benefits in data quality, operational efficiency, and transparency.

One evident pattern across each case study is the growing trust in advanced technology to improve accuracy and efficiency. In fact, some jurisdictions such as Maricopa County, Philadelphia, Riverside County, and Cook County have implemented different tools: GIS, aerial photo imagery, artificial intelligence, and machine learning, to automate data collection, improve accuracy, and reduce manual burden.

These case studies confirm that modernization efforts can work and receive a positive rate of return from investment. Specifically, Maricopa County reported a 10:1 ROI and reduced the onsite inspection responsibility to below 0.5%, while Philadelphia incorporated machine learning technologies and lidar, allowing them to generate updated building sketching and floor areas with high accuracy across large zones of the city. These results reinforce that technology-driven modernization is both scalable and cost-effective when implemented strategically.

Another common trend visible in the findings is the dual emphasis on improving data quality and establishing fairness within the property tax system. All three jurisdictions articulated that accurate data form the basis of equitable taxation. For instance, Maricopa County discovered previously unrecorded property characteristics which resulted in a $1 billion increase in the taxable base. Riverside County has implemented an AI valuation system that improved valuation accuracy and reduced the workload for staff. Both examples illustrate the link between modernization, equity, and taxpayer confidence. The combination of improved efficiencies and equity presented in these examples indicates that not only does modernization constitute more than just efficiency, but it also serves the public interest.

This research shows also the importance of combining traditional modeling strategies with AI-driven modeling methods. The case study with interpretable AI captured this idea that we are moving away from least-squares regression and toward more sophisticated methods to explain complex, non-linear data variables while maintaining the ability to explain to non-technical people their effects on property values. Simple outputs like SHAP values and partial dependence plots are being utilized to explain how individual components of properties affect the model predictions while indicating that the outputs are understandable and usable by assessors and key stakeholders, addressing some of the "black box" issues of artificial intelligence methods.

The enterprise AI systems cited in Riverside County and Stark County are also solid evidence that modern modeling approaches can achieve valuation accuracy improvements of over 40% in accuracy and are able to produce outputs which are readily interpretable and acceptable within the professional practice of property valuation activities.

Organizational change management is another pattern that emerges consistently across findings. Cook County's system modernization and Riverside County's AI training programs highlight that modernization extends beyond technology adoption. For instance, it requires cultural and operational adaptation. Change resistance from staff and concerns about automation were common, but through training, communication, and engagement, these challenges and risks were effectively mitigated. This shows that successful modernization depends on balancing innovation with staff inclusion and developing new skillsets across the organization.

Modernization is about increased transparency and public access. The use of online tools and platforms, such as the SmartFile portal in Cook County, Illinois, and AI evidence packages in C3 AI's systems, has created more open and engaging spaces for taxpayers. These tools can improve service

delivery, simplify the appeals process and exemption recommendations, and ultimately build public trust by making property data for property valuation agencies more accessible and understandable.

The evidence suggests that modernization in property valuation is a continual process developed through collaboration with technology, people, and governance. Jurisdictions are moving towards more integrated, data-driven systems that promote accuracy, efficiencies, and fairness. The trend is consistent within the results from the cases: technology is not replacing professional judgment, but rather supporting and strengthening it. By using AI, GIS, and automation together, assessment jurisdictions across the U.S. are developing more equitable, efficient and transparent systems of valuation that better serve government and the public.

Conclusions and Recommendations

Recommendation 1

The research and case studies reviewed demonstrate a clear trend: assessment jurisdictions must begin exploring and adopting more efficient techniques to modernize their processes. Traditional, manual methods of data collection, valuation, and review are increasingly costly, particularly for large jurisdictions facing expanding property counts each year.

The good news is that numerous assessment organizations such as Maricopa County, the City of Philadelphia, Riverside County and Cook County have already proven that this change is possible. Their projects have demonstrated actual benefits in accuracy, efficiency, and equity, and provide proven models that other jurisdictions can learn from.

Recommendation 2

Modernization is not limited to a single process, there are multiple aspects of assessment valuation and administration that can be improved, including data collection, data modeling, appeals processing, and quality control.

Recommendation 3

Assessment jurisdictions should evaluate all areas of their business, such as their data collection, valuation modeling, or review/appeal processes to analysis if any areas are inefficient and/or identify the area that is the least efficient.

Recommendation 4

Start with smaller modernization projects rather than attempting to overhaul all processes at once. Approach it in a realistic manner, breaking down modernization goals into smaller, targeted initiatives. Approaching modernization projects in this manner should provide more focus and result in a measurable success while reducing risk.

Recommendation 5

Plan for downstream impacts. When modernizing a single step in the process, consider how it interacts with downstream workflows and how it will integrate with future modernization efforts.

Recommendation 6

Adopt agile frameworks. New systems and processes should be developed in a way that allows for adaptability. Building with agility enables jurisdictions to refine processes over time and respond to new requirements, technologies, or legislative changes.

Implementation Plan

Short term: Research and identification of the assessment process that are inefficient. Research should focus on proven modernization techniques that offer the greatest ROI, informed by case studies or implementation by other jurisdictions.

Medium term: Planning and early implementation. Once areas of improvement are identified, detailed planning must begin. Planning is critical, while less exciting than implementation, it is the step that will determine the success of modernization.

Long term: Full implementation and integration. Broader modernization efforts should follow, recognizing that many processes will require substantial testing, change management, and in some cases, policy or legislative updates. As new processes are implemented, integration across functions should be carefully managed to ensure that future modernization steps complement one another rather than creating silos.

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Focus Group Number 3
Business Process Modernization:
Australia and New Zealand

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Executive Summary

This report presents a comparative review of how valuation agencies in New Zealand and Australia are modernizing their business processes and stakeholder interactions using technology, automation, and artificial intelligence (AI). The findings are based on case studies, interviews, and web-based research conducted by Focus Group 3 of the International Property Tax Institute (IPTI) Collaboration Project.

Key Themes and Insights

Technology Platforms

New Zealand operates under centralized oversight but relies on outsourced providers, mainly Quotable Value and Opteon, who deliver valuations using Computer-Assisted Mass Appraisal (CAMA) systems across most councils. Australia, by contrast, is federated: Victoria and Western Australia use VM Online, a statewide CAMA system operated by Domain but overseen by the Valuer-General, while New South Wales developed ValIQ, its own in-house CAMA platform. Other states continue with separate systems or outsourcing models.

Planned Future Technologies

New Zealand providers are extending CAMA capabilities with real-time valuation infrastructure, automated sales and image classification, and exploring chatbots for objections. In Australia, states are enhancing existing systems: Victoria is integrating sales evidence and reporting, Western Australia is developing near real-time valuations, and New South Wales is trailing machine learning and AI assistants for support functions.

Business Process Re-engineering

New Zealand councils have restructured around outsourced service models, replacing manual tasks with automated sales classification, building consent processing, and digital objections. In Australia, reforms have been broader: Victoria consolidated council systems into one statewide process, Western Australia moved from desktop-based ValSys to cloud-enabled VM Online, and New South Wales shifted to workflow-driven platforms integrating previously siloed functions.

Improved Business Processes

New Zealand now benefits from automated sales processing, semi-automated appraisals, and transparent digital objections with low objection rates, supported by real-time valuation models refined by valuers. Australian jurisdictions report measurable gains such as reduced acquisition processing times in NSW, faster supplementary valuations, consistent statewide results in Victoria, and improved staff satisfaction.

Stakeholder Communication

In New Zealand, ratepayers engage through online property searches, digital notices, objection portals, and tools like “rates pie” and “Update My Property” that improve understanding and interaction. In Australia, VM Online and ValIQ enable councils and ratepayers to access data directly, track objections in real time, and receive automated updates, reducing administrative burden and improving transparency.

Most Effective Technologies

New Zealand's most effective tools are objection portals, property search functions, and self-service features that improve user transparency and efficiency. In Australia, unified platforms such as VM Online and ValIQ stand out, combining workflow management, self-service portals, geospatial integration, and cloud-based accessibility to strengthen engagement across stakeholders.

General Recommendations

- Invest in modern business technologies including CAMA systems, cloud-based platforms, and AI for support functions whilst ensuring legal defensibility for statutory valuations.
- Plan future technology adoption focusing on platform capability enhancement, real-time processing, and predictive analytics.
- Re-engineer business processes to leverage automation, consolidate fragmented systems, and enable lean operational models through strategic technology deployment.
- Measure and monitor technology improvements through performance metrics, processing times, and stakeholder satisfaction to demonstrate tangible benefits.
- Prioritize stakeholder communication through self-service portals, transparent tracking systems, and innovative public education strategies that build trust and understanding.
- Deploy unified platforms and integrated systems as the most effective technologies for comprehensive stakeholder interaction and workflow management.

Business Process Modernization Through Technology: A Review of Australia and New Zealand

Introduction

The International Property Tax Institute (IPTI) has embarked on the International Collaboration Project. Phase 1 produced the "White Paper on Future Proofing the Valuation Workforce" in 2024 and Phase 2 is envisaged to explore the leveraging of technology in the modernization of business processes and interactions with stakeholders by valuation agencies in New Zealand and Australia. This component of the project has been assigned to members of Focus Group Three.

Phase 2 also includes the review of how valuation agencies are undertaking valuations of new sources of renewable power, electricity generation and other innovative solutions, which is being dealt with by a different Focus Group.

Scope and Limitations

The scope of the assignment is aimed at an assessment of the extent of exploiting technology, automation and artificial intelligence in the valuation processes in selected agencies within New Zealand and Australia to the benefit of their customers as well as internal efficiencies.

Limitations of the assignment include:

- As it would not be feasible to give attention to all agencies in the two countries, the focus on a few agencies in both New Zealand and Australia would therefore not be representative of all valuation agencies of the two countries;
- Using and interpretation of information as made available by the selected agencies' websites, the findings might be incomplete, excluding new developments or without taking into consideration wider intra-organizational context and processes;
- Insights as provided by representatives of the selected agencies might be limited to their subjective views, roles and responsibilities, without wider context;
- The richness of the research report and findings was dampened due to various City Councils opting not to participate in the collaboration project.
- Given the limitations as mentioned, as well as the shortcomings due to the part-time and remote nature of the assignment, the research report, findings and recommendations are not exhaustive and should be viewed as a case study, subject to verification and further exploration.

Research Methodology

A qualitative research approach was predominantly employed, relying on case study type research interviews with representatives of valuation agencies, complimented by information retrieved from formal City Council websites.

The nature of interviews is exploratory and explanatory, aimed at understanding of information gathered via other means, such as reports or websites as well as the exploring of organizational processes and decisions.

Purposive sampling is used in the selection of interviewees based on their experience and knowledge of valuation processes and position in the organization to provide the necessary insights as required.

Interviews have been conducted by means of structured questionnaires, augmented in some instances by the distribution of written questionnaires.

Background of the Valuation Processes in New Zealand

Information provided by:

Mr. Callum Taylor, Deputy Valuer General, New Zealand

Website: www.linz.govt.nz

There are 67 local councils in New Zealand.

Property valuation processes, particularly for rating purposes are largely centrally prescribed, though administered locally, with oversight and standards set at the national level.

The valuation processes are prescribed and regulated by national government by means of the Rating Valuations Act of 1998, read in conjunction with the Rating Valuations Rules 2008, issued by the Valuer-General, which provide detailed standards and procedures.

The Valuer-General is a national statutory officer under Land Information New Zealand (LINZ) with the following responsibilities:

- Oversees compliance with valuation rules.
- Audits territorial authorities (local councils).
- Approves rating valuation systems and methods.
- Issues mandatory rules and guidance for consistency across the country.

Valuation standards include:

- Definitions of capital value, land value, and value of improvements.
- Methodologies to be used.
- Requirements for revaluations (between one- and three-year cycles).
- Audit and quality control standards.

Local Implementation:

- Provision is allowed for the outsourcing of valuations by local councils to contracted valuers and valuation companies.
- Councils must adhere to the national rules and submit their valuation rolls to the Valuer-General for audit and certification prior to implementation.
- Provision must be made for the public to object to valuations via a formal process and timeframes.

New Zealand Findings: Case Studies

Wellington City Council

Information provided by:

Mr. Michael Brownie, City Surveyor, Principal Advisor Land Property, Data and Insights Unit, Wellington City Council.

Website: www.wellington.govt.nz

Supplementary information provided by the service provider to Wellington City Council, Mr David Nagel, Chief Commercial & Transformation Officer of Quotable Value Limited.

Website: www.QV.co.nz

Background

Wellington City Council (WCC) is one of nine territorial (local) authorities of the Greater Wellington Regional Council. It is located at the southern end of North Island of New Zealand with approximately 80,000 households.

Out of the 82,500 rating units, approximately 74,500 are residential and 8,000 non-residential representing 70% and 30% respectively of the total capital value.

Governance

In terms of national legislation, City and District Councils in New Zealand need to see to the revaluation of all registered properties within a three-year cycle for auditing and certification by the Valuer General.

Service Provider

Quotable Value Limited (QVL) is a state-owned enterprise and employs around 250 people, including 120 registered valuers, as well as around 40 graduate valuers.

The New Zealand rating operations encompasses 57 out of the 67 local authority contracts, which represents approximately 50% of their annual revenue. Besides services to local authorities, private professional services are offered, including portfolio valuation, residential and business use valuation as well as providing property management services.

QVL also provide rating valuations in New South Wales, Australia, with approximately 30% market share.

Business Model

Given the specialized field of valuations which requires detailed knowledge of market related trends, mass appraisal techniques and professionally registered valuers, the Wellington City Council resolved to outsource the valuation function to a competent service provider based on a tender process, currently awarded to Officer of Quotable Value Limited (QVL).

QVL provide all rating valuation services to Wellington City Council, including roll maintenance, database Management, revaluations, objections, land valuation tribunal services as well as quality assurance.

Liaison between the service provider and the Wellington City Council is done by a dedicated team of eight staff members in the Land Property Customer Information Team within the Data and Insights Unit. This team is also responsible for seeing that valuation notices are sent to property owners by the Valuation Service Provider, including the administration of the objection process within the valuation cycle. The Team is also responsible for road naming, assigning property addresses, accurately identifying all properties and recording names and contact details for all ratepayers.

The key principle followed is that valuations are market related at a specified date within the approved valuation cycle and are not manipulated to meet revenue targets. The rates attached to valuations are determined separately by the City Council in accordance with legislation, property categories and rates ratios as defined by the Finance Department.

A three yearly general valuation cycle is being employed where all the properties are revalued based on capital value (land values are also recorded but not used to calculate rates), which represents the likely price of the property at the valuation date, comprising the total of the land and improvement (dwelling) values. Implementation of newly determined rates of the valuation cycle coincides with the new financial year, in this case effective 1 July.

In addition to the scheduled three-yearly revaluations, properties are continuously revalued to reflect status changes, such as improvements and subdivisions. These updates are carried out daily, with relevant information provided to QVL as part of the routine maintenance and updating of the

valuation roll. All maintenance valuations are done as if valued on the date of the last city wide three-yearly revaluation.

Valuation Processes

The following valuation business processes are employed by the service provider, Quotable Value Limited (QVL):

Roll Maintenance

Building Consents

Building consent schedules are provided to QVL electronically by WCC monthly, followed by regular updates on progress of each consent from the WCC officer's property inspection notes. Plans and specification documents are provided to QVL for each building consent, as well as photographs from WCC building inspections, enabling QVL to harvest details of bedroom/bathroom numbers, construction and quality details for inclusion on the Council's District Valuation Roll (DVR). Once enough data has been harvested, the property is automatically appraised, supported by comparable properties enabling a valuer to check and confirm the valuation before adding the details to the DVR. This may involve an inspection of the property. This is currently a semi-automated process.

Subdivisions

"Standing Orders" are received weekly from Land Information, New Zealand (LINZ) notifying QVL of new survey plans which may require a new valuation to be created. These are set up by a central administration team within five working days and then picked up by the valuers to complete the valuation process using existing properties on the DVR as valuation comparisons. This may require an inspection of the property. This is currently a manual process.

Sales Processing

Sales are received primarily from a central portal via Land Information Online and processed automatically each day as they are received. The sales details (date of transaction, price, nature of transaction, GST etc.) are ingested into QVLs database and each sale is automatically "classified" to determine if it is a market or non-market sale, or if suspicious and requires investigation. Sales are analyzed automatically, but each analysis is reviewed by a valuer to ensure it reflects current market conditions, especially the allocation between land and buildings. This is an automated process.

Revaluations

QVL utilize an Automated Valuation Model to assess a "real time value" in determining the capital and land value for residential properties. This also includes lifestyle properties. Similar processes are currently being developed for rural, business, investment and civic property to enable the Automated Valuation Model to value all properties in the jurisdictional area, daily. The Automated Valuation Model for real time valuations is fueled by sales information as well as an extensive property database holding the mandatory fields required within the DVR, as well as significant additional property datasets considered important to determining value. These are elements such as school zones, sunshine hours and natural property hazards.

Valuers use the real time values as a "first cut" of the proposed valuations and then refine these through targeted property inspections and analysis of secondary evidence (on the market data etc.) and complete a comprehensive basis document which supports the proposed values. The Quality Assurance team provides oversight throughout the revaluation process.

The Office of the Valuer General then completes a three-week independent audit of the valuations as regulators, which includes an onsite visit. This is a semi-automated process.

Objections

This is a legislated process as prescribed by the Rating Valuations Act of 1998.

The trend is that between 1-2% of property owners object to their revaluations. A smaller proportion object to their roll maintenance valuations.

QVL have automated the collection of objection information using an online portal where owners confirm the physical details of the property such as bedroom numbers and bathrooms, plus they are required to provide details of their objection, including contact details, plus contended values and the ability to upload photos, reports and links to other information. Valuers then inspect the property (internal or external) and make a value determination which is recommended to the local authority for approval. An objection valuation report is automatically created once the inspection has been completed and emailed to the objector to provide transparency with the outcome of the objection, including photographs and property assumptions as well as comparable sales used to support the value outcome. Objectors are notified separately of the outcome and advised of the next steps if they seek a hearing at the Land Valuation Tribunal if they are not satisfied with the outcome.

Data Management

The recording of all property transactions, including land information, purchase, valuations, disputes (objections and appeals), property status changes due to subdivisions or consolidations are recorded on a centralized system, developed internally with the assistance of specialist. The system has been in place since 1999 and is being maintained and updated to answer to the opportunities and growing demands of automation and data management. The system, inter alia, makes provision for daily updates from the centralized Land Information New Zealand (LINZ) agency, which insures the most recent and updated land and property information.

Rates are determined by the Finance Department based on the individual property values transferred daily from the valuation system to the billing system via an automated process.

The entering of valuation-related information on the system is restricted to profiled staff members. The system provides audit trails of all entries and changes made to property data. A range of user profiles exist for accessing, viewing, capturing and changing of information by staff members of the Wellington City Council.

Customer Care

Technology is used in assisting customers in a user-friendly way. Property search and the display of non-personal information including valuations, rating categories, sales information and property attribute data is available on the City Council's website. Customers are encouraged to register on the website for access to their valuation notices and communication via email, opposed to ordinary posted mail. In the same way objections can be submitted via email for consideration by the

professional valuers of the service providers for confirmation by the administration of the City Council and amendment of municipal rates accounts, where applicable.

Wellington City Council, in its communication of the 2024 revaluation, utilized its property search tool in concert with a powerful communication strategy: the "rates pie" analogy. The council used this analogy to explain that revaluations do not increase the total amount of rates collected but rather alter each property owner's slice of the total "pie." The property search tool was the key technology that allowed ratepayers to see their specific valuation, compare it to the city-wide average value decrease, and understand how their rates would be affected. This on-demand, personalized data delivery directly managed public expectations and provided clarity on a complex issue.

Technology and Innovation

As described above various technology, artificial intelligence and innovation is employed by the service provider, including:

Computerized assisted mass appraisal (CAMA).

Electronic interface with external agencies such as Land Online, Land Information New Zealand as well as the client, namely Wellington Cit Council.

Electronic change detection is not used at this stage.

The electronic property register (valuation roll) is available to customers to access property information via the online portals www.updatemyproperty.co.nz Owners can use the portal to update property data. The portal is also used for property surveys, confirmation of rental data for business properties and land use information for farming operations.

Artificial intelligence is used with the Valuation Automation Model, including interpreting images, floor plans and building specifications documents.

Major automation initiatives include enhanced real time valuation infrastructure to enable hierarchical data structure and model management.

Innovation is aspired by means of improved models used for image classification, and harvesting documentation through third party agreements.

The utilization of Chatbot technology is being investigated to be introduced in the next 12-18 months as avenue for customers to raise objections.

QVL is eager to exploit the future use of technology and innovation by exploring opportunities in partnering with other non-competing agencies, especially around large infrastructure opportunities.

Future

The Wellington City Council administration is continually looking at ways to be more efficient, reduce costs, have greater accuracy and more timely information. Major changes are managed as separate projects and smaller changes done as process improvements, depending on costs and benefits.

The City Council has a license for all staff to use Copilot Chat. Efforts are being made to integrate the use of it in the improvement of business processes, including research.

Conclusion

Technology and automation are used by the Wellington City Council in three major ways:

1. Housing of all property data on a centralized system in a standardized and secure way, including the history and all property transactions. The system is being updated to accommodate refinements, business processes and security.

2. Relying on the expertise of external service providers for the use of international best valuation practices, including computer assisted mass appraisal (CAMA) software and applications, techniques and methodologies to ensure market related valuations, which can withstand audit and scrutiny.

   The outsource approach allows for the City Council to obtain the benefit of cutting-edge innovation in response to their strategic goals, specifications and desired outcomes.

   This model holds the advantage of cost efficiencies by not carrying costly staff costs and benefits, office accommodation and day-to-day operational expenses, materials and equipment. The mentioned advantages must be balanced against over-reliance on external resources and disempowerment.

3. Providing customer friendly options to property owners of inspecting objective property data on the City Council's website and electronic communication via email.

Web-based New Zealand Case Studies

Besides Wellington City Council as covered above, invitations to several other City Councils in New Zealand were declined so they did not participate in the voluntary collaboration project.

The following web-based information has been extracted for a few City Councils to assess the technological transformation of property valuation for taxation in New Zealand.

Auckland City Council

As the largest council in New Zealand, Auckland Council has re-engineered its service delivery by employing two service providers, namely, QV and Opteon, to handle its general revaluations. This dual-provider model is a strategic decision to enhance market coverage and competition and distribution of the workload for its vast portfolio of over 630,000 properties. Following the 2024 revaluation, which saw significant market shifts, including 9% decrease in residential values and 5% increase for industrial properties, the council received over 10,500 objections. Objection processing is now handled by both service providers, as part of a multi-provider model aimed at improving efficiency and increasing capacity for managing large-scale administrative tasks.

Hamilton City Council

Hamilton City Council has partnered with Opteon to re-engineer the public-facing aspects of its valuation process. The business process is streamlined around a digital-first approach, where the public can access their new property values and related information through a centralized online

property search database. This system allows for the immediate delivery of valuation data, eliminating the need for many manual inquiries and improving overall efficiency. The online portal also serves as a communication tool, explaining that a change in valuation does not necessarily lead to a proportional change in rates, thereby managing public expectations and reducing administrative burden.

Christchurch City Council

Christchurch City Council's business process, administered by QV, is re-engineered around the principle of continuous data integration. The council automatically shares information from all building consents and survey plans with its service provider. This proactive data-sharing ensures that the valuation roll is consistently and accurately maintained between the three-yearly revaluations. The public objection process is also streamlined through technology, with online forms, a dedicated email address, and a phone support line managed by the service provider. This shift has transformed a historically cumbersome, paper-based process into a more efficient, digital one that is easier for the public to navigate.

Rotorua Lakes City Council

In a district with a dynamic and rapidly changing property market, Rotorua Lakes Council has re-engineered its valuation approach by engaging Opteon and adopting a "mass-appraisal approach". This method allows the council to efficiently value a large number of properties at a single point in time, a critical capability for managing market fluctuations. The council has also created a public-facing Rating Information Database (RID), which provides transparent and centralized access to rating and valuation information for all properties in the district. This database empowers the public with self-service capabilities, reducing the volume of direct enquiries to council staff.

New Plymouth District Council

New Plymouth District Council’s valuation process with QV is designed to automate the capture of property changes that affect valuation. The council’s system is configured to automatically inform the service provider when a property owner completes building work that requires building consent or a subdivision. This trigger-based workflow ensures that the valuation roll is updated accurately and proactively, preventing a common issue where property values become outdated due to unrecorded renovations or new construction. This technological integration demonstrates a strategic re-engineering that shifts from a reactive, periodic update model to a continuous, automated maintenance process.

Palmerston North City Council

Palmerston North City Council has adopted a highly effective online objection portal, hosted by its external service provider. This technology provides a streamlined, accessible, and transparent process for ratepayers to express a grievance with their valuation. Rather than requiring a mail-in form, the online portal allows for the submission of objections with clear instructions and provides an immediate confirmation email as proof of lodgment. This approach not only modernizes a key administrative process but also significantly improves the user experience by reducing friction and providing a clear audit trail.

Carterton District Council

Carterton District Council, in partnership with their external service provider, empowers its ratepayers with a proactive data-sharing tool called the "Update My Property" service. This service addresses a common source of valuation inaccuracy: home improvements that do not require a building consent, such as a new kitchen or deck. The tool allows property owners to voluntarily submit this information online, including photos and supporting documents, ensuring that their valuation is more accurate and up-to-date. This service proved to be an effective example of how technology can shift part of the data maintenance responsibility to the ratepayer, improving data quality and reducing administrative overheads.

Central Otago District Council

The Central Otago District Council has created a centralized online rating and property search portal that serves as a single source for its stakeholders. This portal provides access to a comprehensive range of information, including capital, land, and improvements values; legal descriptions; and detailed breakdowns of rates. It also includes links to an objection form, demonstrating a seamless collaboration between the council and its service provider. The effectiveness of this technology lies in its transparency and accessibility, which helps the public stay informed and reduces the need for direct enquiries.

Queenstown-Lakes District Council

In the growing Queenstown-Lakes District Council, managing the stakeholder engagement is a challenge. The council has leveraged technology to handle the high volume of enquiries that accompany a fast-moving market with significant value changes. The council is transitioning to digital delivery of valuation notices and directs all enquiries to its service provider’s online objection forms and dedicated phone lines. By providing a granular breakdown of valuation changes by suburb and sector on its website, the council offers a high degree of transparency and helps ratepayers contextualize their property's value change relative to the market.

Christchurch City Council

The current use of technology by Christchurch City Council includes the search function on the council’s website including the valuation roll and the downloading of PDF objection forms. It is planned for the increased digitization of the valuation roll, improved integration of building consent and land-use datasets into valuation workflows over the next few years.

Conclusion

The following central themes have been identified from the web-based New Zealand case studies:

(i) The valuation agencies in New Zealand are leveraging a suite of modern technologies, via appointed external service providers to enhance efficiency, accuracy, and scalability of property valuations in the respective City Councils. The foundation of this technological ecosystem is the Computer Assisted Mass Appraisal (CAMA) system. This is a core process that allows for the valuation of a large group of properties, using standardized data, common methodologies, and statistical analysis.

(ii) The centralization of data is used to increase the accuracy of valuations, underpinned by the quality of the source data, which is captured and processed through a variety of automated and digital procedures. The shift seems to move away from physical assessments towards the exploitation of digital information.

(iii) Technology has significantly reshaped how councils communicate with their customers. The traditional model of sending paper notices and handling enquiries via mail and phone is being replaced by digital-first strategies that prioritize transparency, accessibility, and self-service. The primary goal of these initiatives is to empower the public with on-demand, personalized information, thereby improving both the user experience and administrative efficiency.

(iv) The common tools for efficient customer care include online property search portals and interactive GIS maps, which provide instant access to valuation and rates information. The development of self-service tools, such as the ability to update contact details online or submit forms for rates rebates and remissions, further shifts the paradigm from a council-centric, reactive approach to a proactive, user-driven one.

(v) A key theme is the delicate balance between automation and human processes. While automated valuation methods and systems provide the efficiency to manage a high volume of properties, the role of the human valuer remains indispensable for quality control and applying discretion on unique or complex properties. The technological advancement, particularly in mass appraisal, has not eliminated the valuer's role but has re-engineered it to a more strategic level of analysis and verification.

(vi) The question could be raised on who should take the lead in using technology and innovation in the valuation processes: the local council or service provider? One school of thought could be that councils would look and expect service providers to be on the cusp of the latest technological innovations. Service providers have the advantage of working transversal between various councils and even across country boundaries, where new ideas could be picked up. Conversely, it could be argued that the brief as determined by the local council as client should set clear specifications of the technologies required in providing the required outcomes such as efficiencies and customer centricity. The solution might lie in benchmarking exercises between local councils across borders as well as the call for competitive proposals specifically aimed at proposed technologies and innovations as precursor to the appointment of a service provider responsible for the valuation roll.

Background of the Valuation Processes in Australia

Australia's property assessment system for taxation is shaped by its federal structure, resulting in a diverse and locally adapted landscape. Across 8 jurisdictions, nearly 13.7 million properties are assessed, with numbers ranging from 2.64 million in New South Wales to just 88,536 in the Northern Territory. This scale and fragmentation reflect the absence of a strict national system, as each state and territory has developed its own practices in response to local needs, resources, and historical context.



Assessment cycles and methodologies vary significantly. Some states conduct annual valuations (NSW, Victoria, South Australia, Western Australia), while others use multi-year cycles (Tasmania, Northern Territory, and some municipal assessments in NSW). Hybrid models, such as Queensland's rolling extensions and the ACT's five-year averaging, further illustrate the diversity. Re-inspection approaches range from risk-based systems (NSW) to systematic cycles (Victoria, NT) and flexible, needs-based schedules elsewhere.

Governance and service delivery models also differ. Most states rely on direct government provision through centralized Valuer-General offices, while the Northern Territory, and ACT outsource to private sector providers. Oversight and quality assurance mechanisms vary, with some jurisdictions maintaining rigorous controls and others adopting more basic contract management.

Valuation methods have evolved from manual appraisals to sophisticated, data-driven mass appraisal systems. Jurisdictions increasingly integrate multiple data sources - sales, construction costs, rental information - into centralized databases, supported by automated and manual quality checks.

Public transparency is maintained through formal objection and appeal processes, with some states handling thousands of objections annually (e.g., NSW: 47,000 supplementary valuations, 6,586 objections). Valuation data is used for government policy, compensation, acquisition, and market analysis, though the degree of integration varies.

Funding and resource allocation reflect local priorities, with models ranging from full state funding to mixed arrangements and fee-for-service contracts. Technology investment and staffing models differ, as do approaches to quality assurance.

Regional and demographic factors further shape the system. Metropolitan areas present different challenges than rural regions, and jurisdictions must address issues of growth, economic diversity, and market maturity.

In summary, Australian property assessment for taxation is a product of federated governance, local adaptation, and pragmatic evolution. The system's diversity in scale, timing, governance, and methodology provides a rich context for understanding the technological innovations and themes explored in the main body of this report.

Australia Findings: Case Studies

Victoria

Context for Property Assessment in Victoria

In Victoria, the Valuer-General Victoria (VGV) is the statutory authority responsible for ensuring consistent and defensible property valuations across the state. These valuations underpin the collection of both local government rates and state land tax, together amounting to over $16 billion annually. Prior to 2019, responsibility for valuations lay with Victoria's 79 local councils, who managed their own valuation cycles, systems, and quality controls. This fragmented approach created inconsistencies in both accuracy and timing, as urban properties were often valued every two years while rural and regional properties could go up to six years without reassessment.

The introduction of major reforms in 2019 shifted responsibility for revaluations to the VGV, establishing a centralized model that delivered greater uniformity and accountability. At the same time, the frequency of revaluations was increased to an annual cycle, ensuring values remain closely aligned to market conditions. To support this shift, the state deployed VM Online, a computer-assisted mass appraisal system (CAMA) operated by Domain Insight, which now serves as the core platform for managing valuation processes across Victoria. Approximately 20 private sector valuation firms are contracted to undertake the assessments, but all activity is coordinated, monitored, and quality assured by VGV through VM Online. The reform has created a more coherent, transparent, and technology-enabled valuation framework for Victoria.

Modern Business Technologies

The technological backbone of Victoria's reformed valuation process is VM Online. This platform provides a single statewide environment where contracted valuers can enter and update property data, review comparable sales, and produce assessments in line with legislated error tolerances. The system supports computer-assisted summation methods and incorporates statistical modelling and GIS-enabled analysis for quality control. Crucially, it also enables VGV to monitor valuation activity across the state in real time, ensuring both compliance and consistency.

The transition to VM Online also included modernization of stakeholder services. A dedicated online objections portal was introduced, giving ratepayers a direct and transparent means of lodging objections and tracking their progress. For councils, this reduced administrative burden and shifted much of the customer service role to a centralized and standardized process. Supplementary valuations those triggered by changes such as new construction, rezoning, or exemptions are also now processed more efficiently through automated workflows. In addition, the integration of Vicmap, Victoria's authoritative geospatial dataset, ensures that property, parcel, and address data are consistently aligned with valuations, improving both accuracy and usability. Finally, transparency is supported through Land.Vic, which publishes quarterly sales statistics and annual valuation reports, making information more accessible to councils, state agencies, and the public.

Planned Future Technologies: Next 3 Years

Looking ahead, Victoria's modernization agenda is focused less on procuring new platforms and more on extending the capabilities of VM Online. The emphasis is on deepening integration of sales and property evidence, strengthening reporting and dashboards for councils and central agencies,

streamlining supplementary valuation workflows, and continuing user training so the annual program runs with greater consistency and transparency year on year.

On automated valuation models (AVMs), VGV is exploring options but has not yet found a tool that consistently meets Victoria's legislated accuracy tolerances (generally ±10% and ±5% for residential). VGV remains open to adopting an AVM if - and only if - it can reliably satisfy those tolerances, is transparent and explainable, and is defensible in legal settings. Machine learning or AI is not used to generate statutory assessment values under current legislation; in the near term, any data-science tools under consideration are confined to support roles (e.g., quality assurance, screening, or triage), while VM Online's computer-assisted summation remains the basis for producing statutory values.

Business Process Re-engineering through Technology

The introduction of VM Online and the centralization of valuations under the VGV have triggered significant business process re-engineering. Previously, councils relied on their own contractors, systems, and methodologies, which meant that valuation outcomes varied across jurisdictions. By consolidating all valuation activity into a single statewide process, VGV has created consistency in data, methodology, and governance. Councils and their contractors now operate under the same framework, and the VGV can oversee compliance and quality assurance across all assessments simultaneously.

The objections process, which had once been handled piecemeal by councils and was often criticized for its lack of transparency, has been fully digitized and centralized. Ratepayers now have a clear pathway to challenge their assessments, and the process is both trackable and accountable. Similarly, supplementary valuations, once subject to delays and inconsistency, are now handled more quickly and uniformly thanks to systemized workflows. Another important shift is in the way sales and market trends are monitored. Instead of fragmented local record-keeping, VGV now curates and analyses statewide sales datasets, allowing for more accurate monitoring of property markets and more robust valuation quality control.

Improved Business Processes with Technology

The shift to annual, centralized revaluations has yielded several tangible improvements. The valuation cycle itself has become more relevant, with assessments better reflecting current market conditions than under the previous multi-year approach. The system now produces consistent and reliable values across both metropolitan and regional Victoria, improving equity and fairness in taxation outcomes.

For councils, the ability to directly access valuation data from VM Online has reduced delays and improved integration into financial planning and rate setting. Ratepayers, meanwhile, benefit from clearer and more accessible valuation processes, particularly through the online objection portal. Transparency and accountability have also been enhanced, with Land.Vic providing publicly available sales and valuation reports.

Overall, these improvements have not only increased efficiency but also strengthened public confidence in the valuation system. The reforms have delivered faster, more consistent valuations, streamlined objections, and more transparent communication between government and stakeholders.

Use of Technology in Stakeholder Communication

Technology has also transformed the way the VGV communicates with its stakeholders. Councils, agencies, and contractors can log into VM Online to monitor valuation progress, access extracts, and generate reports on demand. Ratepayers can engage with the system through the online objections portal, improving the transparency of the process and reducing frustrations that were common under the old council-run model. The publication of sales statistics and valuation outcomes on Land.Vic has opened access to information for a wider audience, ensuring that valuation processes are not only accurate but also demonstrably fair and transparent. In addition, VGV actively engages with the valuation profession and local government sector through conferences, workshops, and fact sheets, ensuring reforms are well communicated and stakeholders remain informed.

Most Effective Modern Technologies for Stakeholder Interaction

Of the technologies deployed, VM Online stands out as the most significant, as it provides the unified environment that all stakeholders rely on for valuation data and workflow management. The online objections system is another critical advancement, offering direct and transparent interaction for ratepayers. Integration with Vicmap further enhances the quality of valuations by ensuring geospatial accuracy and consistency, while the open reporting channels provided by Land.Vic have improved trust and communication across the sector. Together, these technologies have redefined the relationship between the VGV, councils, and the public, moving the valuation system toward greater transparency, accountability, and efficiency.

Conclusion

Victoria's shift from fragmented council-run valuations to a centralized, annual, technology-enabled system under the Valuer-General represents one of the most significant valuation modernizations in Australia. VM Online has become the cornerstone of this transformation, not only improving accuracy and consistency but also re-engineering key processes like objections, supplementary valuations, and data sharing. Looking forward, the system's capabilities will continue to expand, with AVMs, advanced analytics, and enhanced reporting shaping the next phase of development. The result is a valuation framework that is more reliable, transparent, and responsive to market conditions, delivering clear benefits to government, councils, and the public alike.

Western Australia

Context for Property Assessment in Western Australia

Western Australia (WA) is the largest state in Australia, with its population of roughly two million concentrated in the Greater Perth Metropolitan Area (GPMA). The housing stock is dominated by single-family detached homes rather than high-density apartments, reflecting the state's sprawling urban form. Statutory valuations underpin the funding of essential services in WA, including local government rates, water supply, fire and emergency services, and land tax.

Two valuation bases form the core of this system: Gross Rental Value (GRV), assessed every three years in the Perth metropolitan area (and every 3–6 years in regional towns depending on activity), and Unimproved Value (UV), assessed annually for land tax. Prior to 1978, each local government conducted its own valuations and set its own rating system, leading to inconsistency and inefficiency. The creation of the Office of the Valuer General brought standardization and independence. Today,

the Valuer General sits within Landgate, WA's land information authority, but operates independently in setting valuation directions and certifying results.

For many years, the system relied on ValSys, an Oracle Forms–based valuation calculator developed in 1999. ValSys used a "base home" approach, where a vanilla property value was adjusted for different attributes. While effective in its time, ValSys was inflexible, could not be used online, and required valuers' physical presence in the office. During the COVID-19 pandemic, when staff resorted to carrying desktop computers and VPN kits home to work remotely, the urgent need for a modern, web-based solution became clear. This need led to the adoption of VM Online, a browser-based, cloud-enabled valuation platform already in use in Victoria and South Australia. After extensive testing, VM Online formally replaced ValSys in July 2025.

The following themes examine how modern technology has been applied in WA's valuation system, how it is shaping future directions, and what lessons can be drawn from this transformation.

Modern Business Technologies

The centerpiece of Western Australia's recent modernization is VM Online, a fully browser-based Computer-Assisted Mass Appraisal (CAMA) system. Unlike ValSys, it can be accessed anywhere - whether in the office, at home, or in the field. This mobility has transformed how valuers operate, reducing inefficiency and expanding flexibility.

VM Online integrates workflows and automates many valuation calculations, greatly reducing the number of models required compared to the sub-market base-home approach. It also includes a stakeholder self-service portal where ratepayers can view their valuations, submit objections, and track their progress transparently. Other government agencies - such as the State Revenue Office, Water Corporation, and local councils - can query and download valuation data directly through the system, eliminating delays and enabling more collaborative governance.

The platform is complemented by modern digital collaboration tools, secure cloud hosting, and system integration with other Landgate datasets (including geospatial data). These technologies combine to deliver a modern valuation service capable of processing over a million valuations annually.

Planned Future Technologies: Next 3 Years

Western Australia's adoption of VM Online is secured under a 10-year contractual arrangement, ensuring stability while providing room for continuous development. Rather than seeking new platforms, the focus over the next three years will be on expanding the technological capabilities of VM Online and tailoring it more closely to WA's valuation framework.

One planned enhancement is the ability to generate near real-time valuations, where values are continuously refreshed as new property transactions and datasets are entered into the system. This would reduce reliance on fixed triennial or regional cycles and allow assessments to remain responsive to market conditions. VM Online will also evolve as a tool for data analytics and reporting, equipping the Valuer General's office with the ability to provide interactive dashboards, trend analyses, and predictive insights.

Additionally, the objection process will continue to be enhanced through automation and digital workflows, providing more efficiency and transparency for ratepayers. Finally, although current legislation prohibits the use of AI and machine learning for statutory valuations (due to defensibility

issues in court), the Valuer General's office is trailing AI copilots for internal business support - such as drafting correspondence, streamlining workflows, and managing information resources.

It is important to note that VM Online is still a new system, having only gone live in July 2025. Early use has revealed some minor teething issues, which are being systematically addressed. Ongoing training programs are being rolled out to ensure staff are fully confident in using the new platform, making the coming years as much about stabilization and capacity-building as about introducing new functionality.

Business Process Re-engineering through Technology

The move to VM Online has fundamentally re-engineered valuation workflows. Where ValSys required many sub-market models and hands-on calculations, CAMA has streamlined and centralized processes. Instead of valuers managing hundreds of base-home adjustments, much of the groundwork is now handled by the system, freeing valuers to focus on complex and unusual property valuation cases.

Another key direction is the expansion of the office's role from simply delivering statutory values to acting as a valuation consultant for government. This would include providing market forecasts, scenario analysis, and insights to inform infrastructure investment and housing policy. Technology will play a vital role in enabling this shift by providing data analysis tools, dashboards, and forecasting capabilities.

The shift from in-office, desktop-only systems to cloud-enabled, mobile-friendly tools has also been transformative. Valuers can now operate efficiently in the field, while stakeholders across government can access valuation data directly, removing bottlenecks and duplication. The objection process has been re-engineered from a "black box" into a transparent digital process where taxpayers can track their cases. These changes have repositioned technology as a driver of efficiency and accountability.

Improved Business Processes with Technology

The modernization has produced measurable improvements in several core processes. The production of more than a million valuations annually has become faster, more consistent, and less reliant on fragmented sub-models. Remote working and field access have become seamless, supporting productivity across WA's vast geography, including remote mining and agricultural towns. Through extensive testing and refinement prior to launch, the Valuer General's office has been able to demonstrate that values produced through VM Online achieve around 90% confidence, giving both government and the public assurance in the reliability of the system.

Stakeholder services have improved dramatically. Ratepayers can now self-serve online, reducing inbound inquiries and improving customer satisfaction. Councils and state agencies can extract and use valuation data directly, increasing efficiency in service delivery. The objection process, previously opaque, now provides clarity, transparency, and accountability. These improvements have not only raised efficiency but also strengthened public trust in the fairness and reliability of the valuation system.

At the same time, it remains early days in the rollout of VM Online. While major gains are evident, the system is still being fine-tuned, and ongoing staff training is critical to embed the full benefits of the

modernization. These transitional steps highlight that modernization is not a one-off event but a continuous process of refinement, adoption, and cultural change within the Valuer General's office.

Use of Technology in Stakeholder Communication

Communication with stakeholders has been transformed by digital platforms. Ratepayers now have direct online access to their property information, objections, and status updates. Local councils and state agencies benefit from the ability to query and download valuation data without relying on requests and reports.

Automated updates and system notifications improve communication flow, while collaborative access to shared systems ensures that government partners are always working with up-to-date valuation data. These tools reduce duplication, minimize delays, and enhance transparency, ensuring that stakeholders remain informed and engaged.

Most Effective Modern Technologies for Stakeholder Interaction

The technologies most effective in improving stakeholder interaction have been those that provide direct, self-service access. VM Online's ratepayer portal is a breakthrough in transparency, giving the public confidence in the valuation process. Similarly, the data query and download functions have been invaluable for local governments and agencies, enabling them to integrate valuation data into their operations without administrative overhead.

Equally important are the workflow transparency tools, particularly in the objection process. By replacing uncertainty with clear, trackable progress updates, the system has improved trust and reduced conflict between taxpayers and authorities. These technologies are proving to be the foundation of a more responsive, accountable, and collaborative valuation system.

The cloud-based nature of the platform ensures that these improvements are available to all stakeholders, regardless of their location, from the sprawling suburbs of Perth to the remote mining towns of regional Western Australia.

Conclusion

The modernization of property assessment in Western Australia represents a decisive step in business process transformation. The transition from ValSys to VM Online has re-engineered workflows, improved efficiency, enhanced transparency, and strengthened stakeholder communication. While challenges remain in training, adoption, and system refinement, the benefits already realized show that the platform is fit for purpose and future ready.

Over the next three years, the Valuer General's office aims to expand beyond valuation delivery into strategic government consultancy, leveraging real-time valuations and forecasting tools to inform planning and policy. Western Australia's experience highlights how digital platforms, when designed to support both valuers and stakeholders, can deliver not just efficiency gains but also greater trust, accountability, and public value in the property assessment process.

New South Wales

Context for Property Assessment in New South Wales

New South Wales (NSW) operates one of the largest and most complex land valuation systems in Australia, with over 2.6 million parcels of land valued annually. The system underpins critical public revenue streams, including local government rates, land tax, and compulsory acquisition compensation, and supports broader policy objectives in planning, infrastructure, and housing.

The Valuer General is responsible for ensuring fair, consistent, and transparent land values across the state, and is supported operationally by Value NSW, a specialist agency within the Department of Planning, Housing and Infrastructure.

Valuations in NSW are conducted using a mass valuation approach, designed to ensure consistency and efficiency across a large number of properties. Properties are grouped into "components" based on shared attributes such as location, size, and amenity. Within each component, benchmark properties are selected and individually valued using recent sales evidence. The percentage change in value of the benchmark property is then applied to all properties in the component to determine updated land values.

This approach allows NSW to maintain a high-volume valuation program without inspecting every property annually. Instead, targeted inspections and rigorous quality assurance reviews are conducted in each local government area before values are certified and entered into the Register of Land Values. The system also accommodates statutory concessions and allowances, such as those for heritage restrictions, mixed-use apportionment, and profitable expenditure, ensuring that valuations reflect both market conditions and legal constraints.

Valuations are typically issued every three years, although supplementary valuations may be triggered by changes such as development, rezoning, or subdivision. Property owners receive a Notice of Valuation and have access to a comprehensive online portal where they can view sales evidence, lodge objections, and track the status of their valuation review.

In recent years, NSW has embarked on a significant modernization program, transitioning from a contractor-heavy model to a hybrid delivery system with a growing proportion of valuations conducted in-house. This shift has improved timeliness, reduced costs, and enhanced quality control. The rollout of ValIQ, a cloud-based digital platform, is central to this transformation, enabling real-time access to valuation data, automated workflows, and integration with geospatial systems.

As the system continues to evolve, NSW is positioning itself as a leader in valuation reform, leveraging technology and data to deliver more responsive and equitable property assessments.

Modern Business Technologies

New South Wales has embarked on a major digital transformation of its property valuation system, with ValIQ at the center of this modernization. ValIQ is a cloud-based, modular platform developed by Value NSW to replace legacy systems such as Valnet II. It supports the management of 2.6 million land parcels, underpins $15 billion in public revenue, and enables real-time access to valuation data for property owners, councils, and government agencies.

The platform integrates automated workflows, spatial mapping, and API-enabled architecture, allowing for seamless data exchange and improved valuation accuracy. It supports a wide range of

valuation functions, including rating and taxing, objections, supplementary notices, and compulsory acquisitions. The system is being rolled out in three phases between June 2025 and March 2026, with each release adding new capabilities such as mobile access, retrospective audits, and dashboard enhancements.

ValIQ provides a portal for property owners to manage valuations and objections. Councils and agencies benefit from direct access to valuation data, reducing administrative overheads and improving service delivery. The platform's integration with geospatial datasets and its use of machine learning for predictive analytics mark a significant step forward in valuation intelligence and automation.

This aligns with NSW's digital strategy for efficient public service.

Planned Future Technologies: Next Three Years

New South Wales is entering a pivotal phase in its valuation modernization journey, with the next three years focused on expanding the capabilities of ValIQ, its new digital platform. Rather than introducing new systems, Value NSW is prioritizing feature enhancement, integration, and automation to support smarter, faster, and more transparent valuation services.

Key developments include the rollout of end-to-end objection management, supplementary notice automation, and mobile access for field operations. These features will streamline workflows and improve responsiveness for both valuers and stakeholders. The platform will also support retrospective audits, enhanced reporting dashboards, and improved data delivery to councils and government agencies, ensuring greater accountability and insight across the valuation lifecycle.

ValIQ will integrate land data to support smarter planning. Future releases will embed machine learning and AI assistants, enabling predictive analytics, automated valuation models (AVMs), and personalized stakeholder services. These tools will support proactive communication, smarter valuations, and faster resolution of simple objections.

While statutory valuations will continue to be governed by strict legislative standards, Value NSW is exploring the use of AI in support roles, such as quality assurance, correspondence drafting, and workflow optimization. The agency is also investing in staff training and change management, recognizing that successful adoption depends on building internal capability and confidence.

Overall, the next phase of ValIQ's development reflects a shift from foundational infrastructure to intelligent service delivery, positioning NSW as a leader in valuation reform and digital transformation.

Business Process Re-engineering through Technology

NSW has modernized its valuation system with ValIQ. Historically reliant on external contractors, Value NSW transitioned to a hybrid delivery model, with over 1.5 million valuations now completed internally. This shift has improved control over quality, reduced costs, and enhanced operational efficiency.

ValIQ has replaced fragmented legacy systems with a workflow-driven, modular architecture, enabling automated valuation processes, integrated spatial mapping, and real-time data access. The platform supports rating and taxing, objections, compulsory acquisitions, and commercial

valuations, consolidating previously siloed functions into a unified system. This has allowed valuers to focus on complex cases while routine assessments are streamlined through automation.

Objections are now managed through a transparent digital workflow. Supplementary valuations triggered by development or rezoning are now processed more efficiently, reducing delays and improving responsiveness.

Internally, Value NSW has restructured its teams to align with the new technology. Dedicated units now handle objections, acquisitions, and special valuations, with performance metrics showing significant improvements in turnaround times and staff engagement. For example, the average number of days to complete compulsory acquisitions has dropped from 138 days to 64 days, and employee satisfaction has risen from 53% to 72% over two years.

This transformation has repositioned Value NSW from a service provider to a strategic partner in government, offering valuation insights to support infrastructure planning, policy development, and financial reporting. Technology has become the backbone of this evolution, enabling smarter workflows, better data, and more accountable service delivery.

Improved Business Processes with Technology

The implementation of ValIQ and the expansion of in-house valuation capabilities have led to measurable improvements across New South Wales' property assessment system. Internally, Value NSW now completes approximately 1.5 million valuations annually, with faster turnaround times and enhanced quality control. For example, compulsory acquisition valuations have reduced from 138 days to 64 days, outperforming contractor benchmarks.

Stakeholder services have also improved. Property owners can now access valuations and lodge objections through a real-time digital portal, increasing transparency and reducing administrative burden. Councils and agencies benefit from direct access to valuation data, enabling more efficient financial planning and service delivery.

ValIQ's integration of spatial mapping, automated workflows, and cloud-based architecture has streamlined supplementary valuations and objection handling. These changes have reduced delays, improved consistency, and strengthened procedural fairness.

Use of Technology in Stakeholder Communication

New South Wales has significantly enhanced stakeholder communication through the deployment of ValIQ, a cloud-based platform that centralizes property valuation data and services. Ratepayers now benefit from a self-service portal that provides real-time access to land valuations, objection status, and supporting sales evidence. This transparency has reduced enquiry volumes and improved public confidence in the valuation process.

Councils and agencies access valuation data directly, improving planning. Automated notifications and integrated dashboards ensure stakeholders are kept informed throughout the valuation cycle, reducing delays and duplication.

ValIQ also supports role-based access via secure digital identity systems such as myGovID, allowing tailored interaction for property owners, agents, and council staff. This improves data security while enabling more personalized service delivery.

Beyond the platform, Value NSW engages stakeholders through presentations, media releases, and collaborative forums, reinforcing its role as a trusted source of valuation advice. These digital tools and outreach efforts have repositioned communication from reactive to proactive, ensuring stakeholders are informed, empowered, and connected throughout the valuation process.

Most Effective Modern Technologies for Stakeholder Interaction

In New South Wales, the rollout of ValIQ has introduced a suite of technologies that have significantly enhanced stakeholder interaction. Foremost among these is the customer self-service portal, which allows property owners to access valuations, submit objections, and track progress in real time. This direct access has improved transparency and reduced reliance on manual support channels.

For councils and government agencies, ValIQ's architecture and integrated dashboards provide seamless access to valuation data, enabling faster decision-making and reducing administrative overhead. These tools support collaboration by ensuring all stakeholders operate from a single, up-to-date source of truth.

ValIQ also incorporates workflow transparency features, particularly in the objections process, where automated updates and status tracking have replaced previously opaque procedures. This has improved trust and reduced conflict between taxpayers and authorities.

The platform's cloud-based infrastructure, built on Azure and integrated with spatial mapping tools, ensures scalability and accessibility across NSW's diverse regions—from metropolitan Sydney to remote rural councils. Together, these technologies have redefined stakeholder engagement, making the valuation system more transparent, efficient, and responsive.

Conclusion

New South Wales has undertaken a comprehensive transformation of its property valuation system, positioning itself as a national leader in digital reform. The shift from a contractor-heavy model to a hybrid delivery approach - supported by a growing in-house workforce - has improved valuation quality, reduced costs, and enhanced operational control.

At the heart of this transformation is ValIQ, a cloud-based platform that has redefined how valuations are conducted, accessed, and communicated. By integrating automated workflows, spatial mapping, and real-time data access, ValIQ has streamlined core processes such as objections, supplementary valuations, and stakeholder engagement. The platform's rollout has already delivered measurable improvements in turnaround times, transparency, and staff satisfaction.

Looking ahead, NSW is focused on expanding ValIQ's capabilities through AI-assisted services, predictive analytics, and integrated land data systems. These innovations will support smarter decision-making and more responsive service delivery across government and the community.

Analysis of Findings

Technology Platforms and System Architecture

- **New Zealand** councils predominantly outsource valuation services to providers like QV and Opteon, who deploy advanced platforms such as AVMs and CAMA systems. These platforms are integrated with council systems but managed externally.

- **Australia** shows a trend toward centralized, government-managed platforms (e.g., VM Online in Victoria and WA, ValIQ in NSW), offering greater control, standardization, and scalability.

- The federated model in Australia results in varied adoption timelines and platform maturity, whereas New Zealand's national oversight ensures more uniform standards despite decentralized delivery.

Automation and AI Integration

- **New Zealand** service providers are actively using AI in valuation support functions, including image interpretation and document harvesting. Real-time valuation models are in use for residential properties.

- **Australia** is more cautious: while AVMs and AI are being trailed, statutory valuations remain human-led due to legal defensibility concerns. AI is primarily used for triage, correspondence drafting, and quality assurance.

- Both jurisdictions are exploring predictive analytics, but Australia's public sector-led platforms are more focused on long-term integration and legislative alignment.

Business Process Re-engineering

- **New Zealand** councils have re-engineered processes around outsourced service models, enabling lean internal teams to manage valuation cycles, objections, and data flows efficiently.

- **Australia** has undergone deeper structural reform, particularly in Victoria and NSW, where legacy systems were replaced with unified platforms. This has led to measurable improvements in valuation consistency, objection handling, and supplementary valuations.

- The shift from fragmented, paper-based workflows to automated, digital-first systems is a common theme, though Australia's reforms are more comprehensive and centrally coordinated.

Stakeholder Interaction and Communication

- **New Zealand** councils use portals like "Update My Property" and online objection forms to engage ratepayers. Communication strategies (e.g., Wellington's "rates pie" analogy) help demystify valuation impacts.

- **Australia** has invested heavily in self-service portals, real-time data access, and integrated dashboards. NSW's ValIQ and Victoria's VM Online offer transparent objection tracking and direct data access for councils and agencies.

- Across both jurisdictions, digital tools have reduced administrative burden, improved public understanding, and increased trust in valuation outcomes.

Data Governance and Integration

- **New Zealand** relies on service providers to manage valuation data, with councils maintaining oversight. Integration with national land information systems (LINZ) supports daily updates and roll maintenance.

- **Australia** has prioritized centralized data governance, with platforms like VM Online and ValIQ integrating geospatial datasets (e.g., Vicmap) and enabling real-time valuation monitoring.

- The quality and accessibility of valuation data have improved significantly in both jurisdictions, though Australia's approach offers stronger institutional control and auditability.

Delivery Models and Strategic Control

- **New Zealand's** outsourced model provides access to innovation and cost efficiencies but may risk over-reliance on external providers.

- **Australia's** hybrid and in-house models (e.g., NSW's shift from contractors to internal teams) offer greater strategic control, improved responsiveness, and better alignment with public sector goals.

- The choice of delivery model reflects broader governance structures, with centralized VG oversight in Australia enabling more ambitious reform agendas.

Recommendations

Based on the comparative analysis of valuation agencies in New Zealand and Australia, the following generalized recommendations are offered to support international jurisdictions seeking to modernize their property valuation systems through technology:

Invest in Unified Digital Platforms

- Centralized, cloud-based platforms improve consistency, scalability, and transparency.
- Integration with geospatial data and external systems enhances valuation accuracy and operational efficiency.

Leverage Automation and AI Responsibly

- Automated Valuation Models (AVMs) and AI tools should be adopted for support functions such as quality assurance, triage, and data analysis.
- Statutory valuations should remain under human oversight until AI tools meet legal and ethical standards for defensibility and transparency.

Re-engineer Business Processes

- Replace manual workflows with automated systems for roll maintenance, revaluations, and objections.
- Streamline supplementary valuations and integrate data from planning and building consent systems.

Enhance Stakeholder Engagement

- Provide user-friendly, self-service portals for property owners to access valuation data, submit objections, and receive updates.
- Use personalized communication strategies to improve public understanding and trust.

Strengthen Data Governance and Interoperability

- Ensure secure, standardized data management across agencies.
- Promote interoperability between valuation systems and national land information databases to support real-time updates and policy integration.

Balance Delivery Models Strategically

- Consider hybrid models that combine in-house expertise with outsourced innovation.
- Align service delivery with strategic goals, capacity, and long-term sustainability.

Foster a Culture of Continuous Improvement

- Treat digital transformation as an ongoing process, not a one-off event.
- Invest in staff training, change management, and stakeholder collaboration to embed new technologies effectively.

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Focus Group Number 4
Business Process Modernization: Europe

Group Members:

- Lorna White (VOA)
- Mia Parenteau (PVSC)
- Evelyn Khoo (IRAS, Singapore)

Introduction

Scope and objectives

The aim of the project is to review how valuation agencies in Europe are leveraging technology to modernize or re-engineer their business processes and interactions with stakeholders including customers and taxpayers. Specifically, the intention is to identify:

- The types of modern technology currently used, and plans for the future
- How modern technology is being used, and the improvements or benefits, and effectiveness

Research approach

Given the scope of "technology", prior desktop research was undertaken to identify a "universal nomenclature" or relevant international organization frameworks pertaining to pertinent technology types and deployment for property valuation and assessment functions. In tandem, past presentations and the IPTI's network were harnessed to identify contacts in key Europe valuation agencies to interview about their technology journey, as case studies.

Our interviews covered:

- Agencies' new technology or technology projects and improvements
- Further developments planned and envisaged benefits
- Desired changes to the use of technology

A key point from the interviews and our subsequent analysis was that valuation agencies' use or focus on types of modern technology is determined by core functions and needs. It is thus important to consider their contexts as set out below:

The Netherlands Council for Real Estate Assessments (NCREA)
Country: The Netherlands
Description: The NCREA is a property assessment oversight agency. Local governments (municipalities) determine assessment values and have their own valuation processes. While NCREA does not currently employ valuers, a number in the workforce are past employees of municipalities. The Council has a key role in driving new technologies and developments in municipalities.
Organization size (employees): 22 staff
Property profile discussed: Residential (currently)
Reassessment frequency: Annual
Interviewee(s): Marco Kuijper (Strategy developer)
Date of interview: 17th June 2025

Tailte Éireann
Country: Ireland
Description: "… An independent Government agency under the aegis of the Department of Housing, Local Government and Heritage. Tailte Éireann was formally established under the Tailte Éireann Act in December 2022."[1]
Organization size (employees): 1,000 total, ~120 in valuation. Merged with mapping and property registration authority in 2023.
Property profile: Commercial, industrial, and state property
Reassessment frequency: Every 5-10 years under legislation (extension due to COVID)
Interviewee(s): Don Donovan (Head of Service Delivery), Maurice O'Neill (Chief Valuer)
Date of interview: 19th June 2025

Valuation Office Agency (VOA)
Country: United Kingdom (UK)
Description: "The Valuation Office Agency (VOA) provides the government the valuations and property advice needed to support taxation and benefits."[2]
Organization size (employees): 3,800
Property profile: Residential, commercial, industrial, and state property
Reassessment frequency: 3 yearly non-domestic revaluations
Interviewee(s): Michael Brankin (Director for Business Systems Transformation)
Date of interview: 17th July 2025

Part 1 – The Role of Technology in Valuation and Tax Administration

The valuation agencies interviewed share commonalities, but their use of technology and the prioritization of technological advancements depend on the specific services the organization provides. In considering how technology is being used, we used the International Survey on Revenue Administration (ISORA) definitions for Innovation Technologies[3]:

"Innovative Technologies"	Examples for valuation agencies
(1) Cloud computing	Shared drives (e.g., SharePoint)
(2) Application Programming Interfaces (APIs)	Integration between databases and CAMA systems, public portals

[1] *Source:* https://tailte.ie/about/

[2] *Source:* https://www.gov.uk/government/organisations/valuation-office-agency

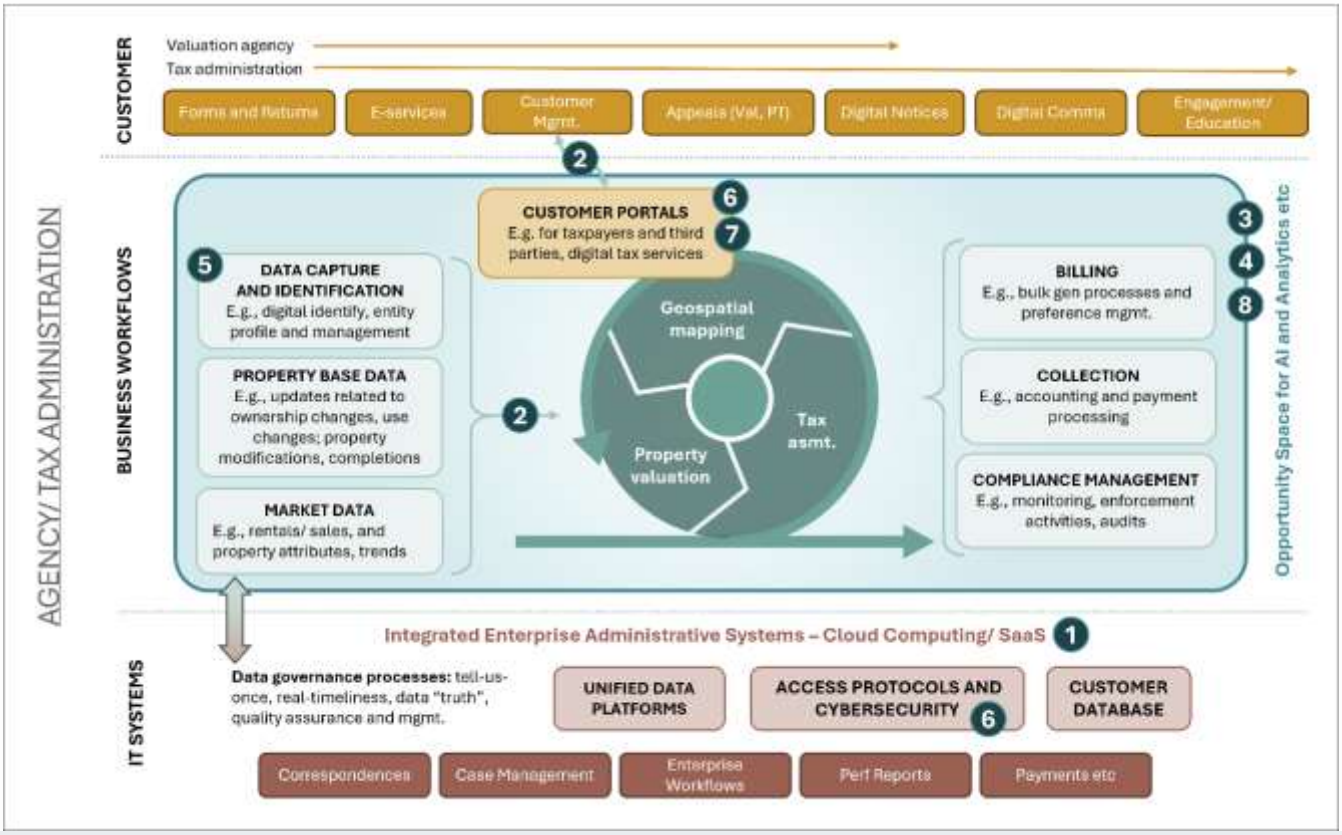
[3] *Source: The ISORA (International Survey on Revenue Administration) is by CIAT, IOTA, IMF and OECD. See* https://data.rafit.org/regular.aspx?key=74180897*, Innovative technologies 1, Innovative technologies 2, Innovative technologies 3*

(3) Data science/ analytics tools	Predictive modelling for market trends, data dashboards
(4) Artificial Intelligence (AI)	Automated valuation modelling (AVMs)
(5) National/WOG Identification systems	Universal digital identity profiles for digital service authentication
(6) Digital authentication (e.g. biometrics, voice identification)	Usernames and passwords, two-factor authentication
(7) Virtual Assistants e.g. chatbots	Public inquiry chatbots
(8) Robotics Process Automation (RPA)	Workflow process automation involving different systems
(9) Distributed ledger/ Blockchain	N/A. Less applicable for valuation agencies

Among the key "innovative technologies" tracked globally, the shift to cloud computing was highlighted as instrumental, complemented by the increasing or envisioned future use of multiple AI and analytics tools for data insights as well as valuation, tax assessment and compliance work. The modernization of interactions with stakeholders was reflected in well-established API-enabled data flows. In addition to valuation agency functions, tax administrations are also managing digital identities and deploying frontline or service-related tools like intelligent chatbots to aid multi-modal taxpayer interactions.

The following diagram depicts how property valuation and tax administration agencies may leverage technology. We recommend that it could also help explain and guide technology planning, change management efforts and communications, as well as interdependencies.

Figure 1: Property Valuation Agencies - Managing Modernization



Use of technology

The following state of technology modernization from interviews with the respective agencies:

	NCREA	Tailte Éireann	VOA
(1) Cloud computing	✓	✓	✓
(2) Application Programming Interfaces (APIs)	✓	✓	✓
(3) Data science/ analytics tools	✓	✓	✓
(4) Artificial Intelligence (AI)	Evolving (In municipalities)	Evolving	Evolving
(5) National/ WOG Identification systems	Citizens have a digital code	X	X
(6) Digital authentication	✓	✓	✓
(7) Virtual Assistants e.g. chatbots	In municipalities	✓	X

(8) Robotic Process Automation	X	X	X

Note: From the interviews, Robotic Process Automation is not a key focus probably due to the emergence of genAI and agentic AI opportunities. Distributed ledger/blockchain technology is also less applicable for valuation agencies.

Part 2 – Technology Modernization Projects

Interviewees were asked about recent and future technology modernization projects in their organization.

Key themes:

- AVM, AI extensions, and advanced analytics
- Database and business system modernization
- External database integration and digital outreach

AVM and AI Extensions, and Advanced Analytics - Overview

An automated valuation model (AVM) is any data-driven statistical model that assists in the valuation of properties. They are typically designed using the sales comparison method of valuation. In the Netherlands, each municipality is responsible for their own assessment and therefore there are varying degrees of utilization of AVMs. The valuation, and by extension the development of AVMs, may also be contracted to private firms. In terms of other AI applications beyond the valuation, some municipalities have used AI to streamline administrative workflows such as appeals and objections. There are also some developments in AI-driven data collection (i.e., aerial photography, extracting information from brokerage sites). The NCREA, in their capacity as an oversight body, recently designed guidelines to help municipalities apply AI technology.

Tailte Éireann has recently added a Python-based plugin which executes a simple AVM. This was a small part of a broader digital transformation project to modernize their Computer-Assisted Mass Appraisal (CAMA) system. The organization is interested in exploring future development of AVMs, and there is growing interest in the potential of not only AI but also advanced data analytics. For example, data can be leveraged to inform decision-making through market analysis and interactive dashboards. Data analysis can support valuation processes through quality assurance measures such as data cleanup, anomaly detection, and identifying new property elements. Chatbots are also being considered to enhance user support.

The Valuation Office Agency (VOA) has developed an AVM for domestic properties in Wales and is also exploring non-domestic valuation modelling. In addition to the modelling itself, there is interest in integrating AVMs within larger business systems and positioning them as scalable and service oriented. In terms of enhancing business processes, there was a pilot initiative where generative AI was used to review email traffic and generate recommendations for case workers. While this has sparked enthusiasm internally, it is important to consider concerns regarding oversight, control, and boundaries of AI governance.

AVM and AI extensions, and Advanced Analytics - Recommendations

1A. Secure Relevant Resources and Expertise

Tailte Éireann expressed interested in developing AI technology but acknowledged limitations due to lack of staff with AI and analytics expertise.

Recommendation: Ensure that your organization has the necessary resources to support implementation of an analytics and/or AI development strategy. Data analysts, data scientists, data engineers, or statisticians might be needed, depending on the specific developments of the organization. These experts may be contracted or hired, depending on the scope of the project or size of the organization. There is also opportunity for upskilling of existing employees, depending on the complexity of the project. Development of AI and analytics tools also requires an in-depth knowledge of existing data and databases. Ensure that these SMEs within your organization are consulted throughout the development process for any AI or analytics development project.

1B. Understand the Business Requirements

All organizations discussed interest in continuing existing AI technology implementation projects, as a result of building on existing ideas or to account for outcomes as the new technology is being implemented.

Recommendation: Development of new analytics tools and AI approaches must consider the organization's computational resources, implementation timelines, desired outcomes, and final operational processes, as they will influence the suitability of different statistical or AI models. Organizational requirements should be well-understood during the development phase to ensure the final product will effectively serve the business needs. In addition, good business knowledge allows for discovery of further opportunities as well as unforeseen outcomes, causing the project scope to improve and evolve.

1C. Evaluate and Ensure Data Quality

How data is collected, stored, and defined is not always straightforward or accurate, especially in a manual environment. Measures need to be taken to ensure that existing data is of an acceptable quality. This is crucial to any data analysis; inaccurate data will yield inaccurate results.

Recommendation: Assess data quality for relevant data sources prior to building AI models or developing analytics. This includes understanding how the data is collected, coded, aggregated, and why data may be missing. Establish clear working definitions and exclusion criteria for the purposes of each analysis. Data cleaning should be done to resolve potential data issues prior to any analysis.

Database and System Modernization - Overview

Both Tailte Éireann and the VOA are in the process of major database modernization projects. Key considerations from these projects are a focus on data governance, and integration with internal and external IT systems. Tailte Éireann's AXIA project entails a shift from a basic caseload system to an all-encompassing mass appraisal and database system, which also has the capacity to accommodate AVMs. This work was done in collaboration with MPAC in Ontario, Canada. To uphold data governance best practices, the new system has added user accountability measures to ensure data

quality. While currently in a process of transition to the new system, accommodating new data rules and discipline has been intense and with much manual work. However, time investment during this phase will produce a much faster process in the future. An improvement and commitment to data governance will result in more extractable and useable data, unlocking further analytics opportunities within the organization.

The VOA is also in the process of a major business system transformation, replacing their legacy system with Microsoft Dynamics and a Postgres database. The project has involved migrating 40 million records into SharePoint so far. This transformation was necessary as the legacy database had outgrown its original purpose; the lack of data discipline allowed users to alter data quickly without verification or oversight. This resulted in a system where there was a lack of continuity, records could be accidentally deleted, and there existed duplicated and unvalidated data. The new system architecture could improve data governance by enforcing stricter rules for data modification and input. Because this will require more effort from the user, a cultural shift is necessary to accompany these new processes. In addition to database upgrades, adoption of Oracle, a CRM, geospatial tooling, and integrations with local government is also part of the scope.

Database and System Modernization - Recommendations

Conduct A Technology Asset Audit

Both Tailte Éireann and VOA are transitioning from legacy systems to modern platforms (AXIA, Microsoft Dynamics, Postgres). Knowing what is out of support or nearing end-of-life is critical.

Recommendation: Catalogue all current systems, databases, and integrations. Flag technologies that are out of support or approaching end-of-life and align findings with the organization's technology strategy to prioritize replacements.

Involve the Right SMES Early

AXIA's collaboration with MPAC and VOA's adoption of Oracle and geospatial tools show that specialist input is essential for success.

Recommendation: Identify SMEs for database architecture, data governance, CRM, and geospatial systems and include them in design and decision-making phases to avoid costly rework. Include SMEs at the planning phase to ensure proper impact assessment.

Don't Rush – Avoid Scope Creep

These types of projects involve cultural and process shifts (e.g., stricter data governance rules). Rushing risks incomplete adoption and poor data discipline.

Recommendation: Split the program into manageable phases. Define clear scope boundaries for

each phase and use change control processes to manage additional requests. Consider adding work that is out-of-scope to a parking lot for future projects.

Modernize Incrementally

"Big bang" migrations often fail. Tailte Éireann's phased approach and VOA's gradual migration of 40 million records into SharePoint are good examples.

Recommendation: Adopt a "continuous improvement" model - modernize a little at a time. Allow insights from existing implementations and projects to generate ideas for future development.

External Data Integration and Digital Outreach

For of the three agencies, integrations with external systems are considered an important aspect of a modern database. In the Netherlands, APIs are used for data communication with the municipalities. Data across all municipalities are then centrally registered. Tailte Éireann's new AXIA system also leverages the use of APIs to pull information from live feeds, websites and the registration office, giving valuers access to more information. Due to the merger with the mapping and property registration authority, they are also working towards integrating these departments' information and see opportunities for data exchange with other government databases.

The VOA is implementing data transfer services with some local authorities. Instead of transferring local files via email, users can now upload files into a system, attach evidence (e.g. building plans), and see the VOA's progress on the case. The project has the potential to be expanded to other local authorities, non-domestic (commercial) properties, and eventually taxpayers. There is also integration with ESRI geospatial products, which allows valuers to conduct data and geospatial searches, and geospatially create boundaries of estates. This technology is the first of type for UK government.

In addition to interactions with external databases, valuation agencies are also interested in using technology to improve external outreach to taxpayers. The Netherlands and Tailte Éireann are both developing business systems to communicate with local authorities and taxpayers. Within Tailte Éireann's AXIA system, there exists portals where taxpayers can be contacted. Its use with local authorities has been positively received. However, due to infrequent interaction with the taxpayer, the efficiency and utilization have been lower than expected. They have expressed interest in improving the business process for the portals for a smoother user experience.

The Netherlands currently has online digital platforms to contact residential taxpayers and is in the process of expanding to commercial properties. The taxpayer has a code and login with the government, which they use to access the portal. Here they can see their bill, valuation report, and their property's data. These developments stemmed from new laws, stating that municipalities must get into contact with the taxpayer to verify the accuracy of the data every four years.

External Data Integration and Digital Outreach - Recommendations

"Rubbish In, Rubbish Out" – Prioritize Data Integrity at Source

Poor data quality undermines every downstream process. Agencies like IRAS in Singapore have shown that integrating geospatial modelling and machine learning into valuation workflows improves accuracy and transparency.

Recommendation: Implement validation checkpoints at the point of data entry - whether via customer portals or internal systems - to ensure completeness, accuracy, and relevance. Use structured formats and mandatory fields to reduce ambiguity.

Data Sharing Is Hard - But Essential

The Data-Sharing-Services and Data-Sharing-and-Acquisition documents highlight the importance of structured, secure, and legally compliant data exchange across government bodies and with stakeholder, such as local authorities. The Netherlands and Tailte Éireann demonstrate how APIs can streamline communication with municipalities and centralize data.

Recommendation: Establish joint working groups with local authorities to co-design future data exchange models. Forums can also be used to align priorities, pilot new technologies, and resolve blockers collaboratively. The data exchange model should include:

- API-based integration for real-time updates
- Clear data ownership and usage agreements
- A shared metadata schema to ensure interoperability
- Secure transfer (e.g. encrypted upload portals)
- Feedback loop for corrections and updates

Use Technology to Shape Demand – Chatbots and Portals

Singapore's use of chatbots and tailored messaging via the myTax Portal demonstrates how digital services can reduce inbound queries and improve user satisfaction.

Recommendation: Develop a taxpayer portal that offers self-service options (view valuations, submit evidence), integrates chatbot support for FAQs and guidance and aligns with government standards for accessibility and security.

"Amazonify" The Service – Make It Seamless and Predictable

The goal is not just digitization, but transformation. IRAS's personalized messaging and secure access via national digital identity offer a blueprint.

Recommendation: Apply e-commerce principles, including predictive prompts based on user behavior, transparent progress tracking (e.g. "Your case is at stage 3 of 5"), feedback mechanisms to continuously improve service design.

Part 3 - Additional Considerations in Technology Transformation

Whilst the report has so far focused on the technology components of change, it would be remiss not to acknowledge the wider external inputs and challenges that influence the delivery of a successful transformation. Projects of this nature are complex, high-impact initiatives that extend far beyond a simple software upgrade. They affect every part of the organization - from how legacy systems interface and how people work, to how customers are served and how the organization collaborates with other government bodies. The key considerations below highlight broader contexts to address.

Key themes:

- Data literacy and education on IT systems for project stakeholders
- Challenges with scope and capacity
- Change management within the organization
- Continuous modernization and future-readiness

Data literacy and education on IT systems

To build a realistic and effective set of requirements and scope for any technology transformation project, early and meaningful engagement with all relevant stakeholders (e.g., internal teams, external partners, customers, and caseworkers) is vital to supporting the transformation. It is also crucial to ensuring compliance with relevant regulations and internal policies, particularly around data protection and cybersecurity. Data literacy and education on IT systems at least at a high-level can be useful for all project members, to ensure alignment with organizational objectives, and leadership's understanding the impact from an operational perspective will prevent silos in the requirements. In most cases, stakeholders should be informed and consulted throughout the duration of the project; continuous engagement with end users and subject matter experts will ensure that the project's objectives are achieved.

Challenges with scope and capacity

Due to the highly specialized and complex nature of technology transformation projects, planning and deciding on a scope can be particularly difficult. Organizations should be prepared to adjust timelines or amend the scope during the execution of the project, as it is often the case that technical constraints or opportunities are only discovered during this time. Furthermore, as these projects tend to carry long timelines, the needs of the organization have the potential to evolve before the project has been completed. When it comes time for users to transition to new systems or

technology, a phased approach to a large-scale implementation often carries less risk as it allows for testing and identifying issues prior to a general release. It also allows for users to learn and adjust to the tool while also providing valuable feedback.

Change management within the organization

Where technology development projects tend to be highly technical, change management can become an afterthought. Change management should be a consideration at the outset. During the planning phase, impact assessments can evaluate how workflows will be altered, identify dependencies, and anticipate potential disruptions. Even if the technical solution is flawless, the success of the transformation ultimately depends on the adoption by the end users. Concerns, capabilities, and capacity must be carefully considered to ensure that the intended benefits are realized. Workloads must be managed realistically to avoid overwhelming staff who are already balancing day-to-day responsibilities. Targeted training and development can help bridge skills gaps and build confidence. Throughout the process, clear, consistent, and tailored communication is essential to keep everyone informed, engaged, and aligned. Resistance to change is natural and should be addressed with empathy and transparency.

Continuous Modernization and Future-Readiness

Agencies emphasized the need for ongoing modernization, phased rollouts, and alignment between technology and policy to avoid obsolescence and build resilient, future-proof systems. These practices will help the organization avoid large gaps that require major overhauls. There is always opportunity for technological improvement and innovation. Fostering a culture that values feedback, embraces new ways of working, and encourages learning will help the organization adapt more effectively and sustainably. Leadership is critical in this regard; leaders must not only endorse and invest in transformation and innovation but also communicate a clear and compelling vision, explaining why the change is necessary and what benefits it will bring.

Implementation Plan

Every organization will be at different points in their technological development. The following diagram shows the recommendations (outlined above) aligned to short, medium and long-term timeframes. These recommendations need to be considered alongside the Part 3 - Additional Considerations in Technology Transformation section.



Conclusion

Although there are commonalities across all valuation agencies, the technology requirements and areas of focus will depend on their organizational mandates, legal obligations, size, and resources. The development of AVMs and exploration of AI technology, database modernization with a focus on data governance, and technological synchronization with external stakeholders and systems, are areas of focus for valuation agencies in Europe.

The keys to successfully delivering a technology project include an understanding of requirements from project stakeholders, an adaptable scope and capacity, and change management planning for end users. As technology and the needs of the organization are constantly evolving, continuous technological improvements will avoid large gaps and painful upgrades in the future, ultimately leading to higher quality products and efficient deliveries.

We envisage that the analysis and findings on Managing Modernization (Figure 1) and Key Themes could be part of an IPTI resource toolkit for valuation agencies across the world, that will also draw on the work of other groups on valuation agencies beyond Europe.

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Focus Group Number 5
Business Process Modernization: Asia

Group Members:

- Mariam Jasat (MPAC)
- Katie Crane-Davis (VOA)
- Peck Yan Nang (IRAS, Singapore)
- Hyacinth Picart (NLA, Jamaica)

Introduction

Business process modernization efforts are being driven by many factors within the valuation space. Valuation agencies are increasingly harnessing technology to streamline workflows, enhance operational efficiency, and introduce innovative solutions. These efforts aim to enable valuation professionals to concentrate on complex, high-value tasks while simultaneously developing their skills to keep pace with technological advancements. Modernization initiatives are also being implemented to respond to evolving customer expectations, including the demand for greater transparency and user-friendly, self-service access to data and insights.

The following sections detail the scope and objectives, research findings and expected outcomes of these modernization efforts by valuation agencies in Asia.

Project Scope and Objectives

To ascertain how valuation agencies in Asia are leveraging technology to rethink and modernize business processes and enhance stakeholder interactions.

The research focuses on two jurisdictions in Asia - Singapore (Inland Revenue Authority of Singapore - IRAS) and Hong Kong (Rating and Valuation Department - RVD).

The key topics and objectives include:

1. **Current Use**
    - Objective: Understand the types of technologies currently in use and the scope of their application.
2. **Process Improvement/Re-engineering**
    - Objective: Understand how technology is changing business processes, organization structures and impact to professional staff development.
3. **Technology Effectiveness**
    - Objective: Assess the real-world impact of technology on performance and outcomes.
4. **Stakeholder Communication**
    - Objective: Examine how technology is being leveraged to engage with and deliver services to stakeholders.
5. **Future Plans**
    - What are the strategic priorities for each jurisdiction as it relates to technology initiatives.

Research Approach

Given the cross-functional nature of the team, the Focus Group benefited from having representation from Asia. Following a review of publicly available resources, including websites, presentations and other materials, the project team selected Singapore and Hong Kong for the study, based on their comparable property tax systems and relevant insights. Both jurisdictions are also active members of the IPTI community. The project members leveraged their connections through IPTI and other Focus Group members to secure contacts from both jurisdictions.

The project team assessed that interviews would be the most effective method for capturing detailed insights into business modernization initiatives across the two jurisdictions. An interview guide/questionnaire was prepared based on the focus areas and sent to the two jurisdictions.

With Singapore, a panel of subject matter experts provided perspectives of how IRAS is embracing business modernization initiatives.

For Hong Kong, a key contact from RVD consulted colleagues across the relevant business groups to address questions. Supplementary information was provided to inform final responses.

The interviews and responses provided detailed insights that supported the preliminary research and offered a deeper understanding of how each jurisdiction is approaching business modernization in an evolving property assessment landscape.

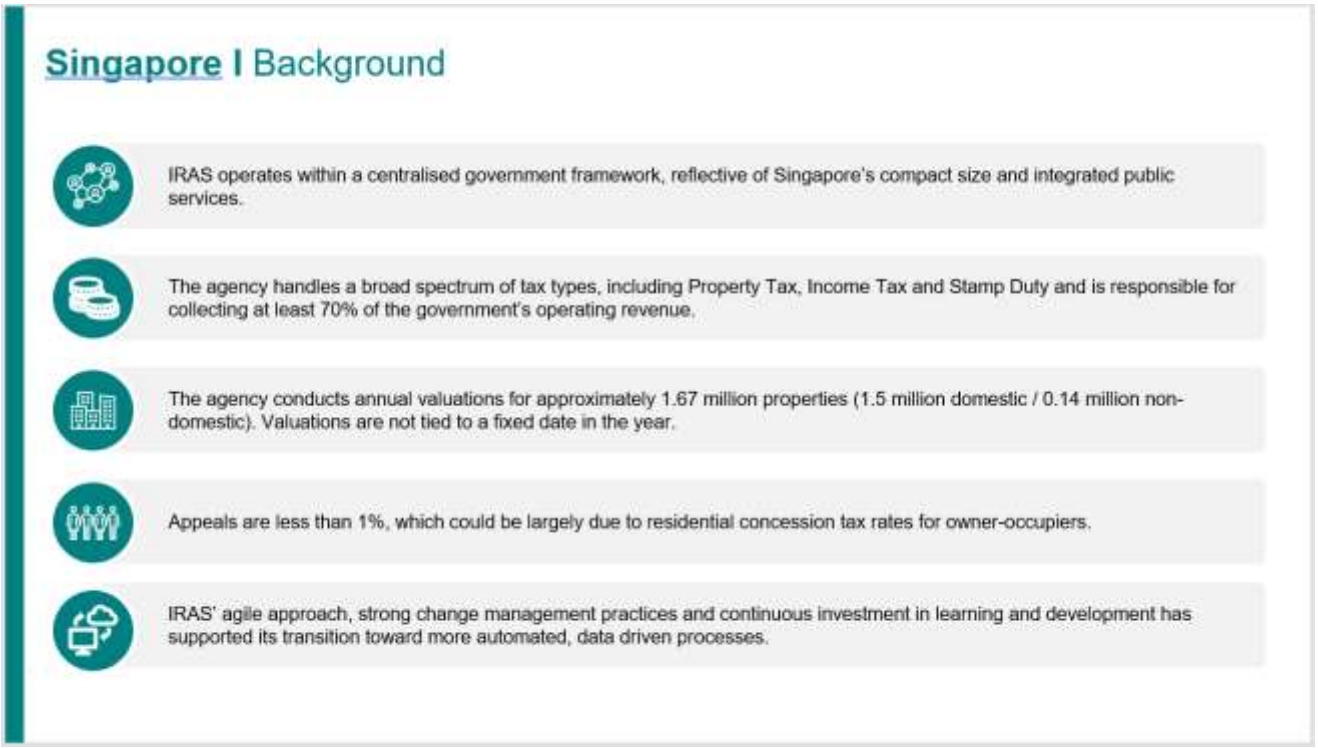
Key Findings and Observations

Through collaborative discussion and exchanges, the following findings are being presented based on the key focus areas for each jurisdiction.

Singapore

The Inland Revenue Authority of Singapore (IRAS) is a statutory board under the Ministry of Finance. IRAS operates within a centralized government framework, reflective of Singapore's compact size and integrated public service infrastructure. The government agency is the national tax administrator, responsible for administering a broad spectrum of tax types and property valuations. IRAS also oversees the distribution of tax concessions, incentives and reliefs for both domestic and non-domestic taxpayers.

Organizational Context:



Current Use of Technology and Business Process Modernization

In order to execute on the strategic priority of improving service delivery and compliance efforts, IRAS continues to embrace technology innovation including its digital infrastructure. It has a robust cloud-hosted internal system known as Inland Revenue Interactive Network (IRIN), built on microservices architecture and Application Programming Interfaces (APIs). By modular system design, it allows for the decoupling of services to support different tax activities such as forms and returns, taxpayer entity management, property valuation and enforcement. Simultaneously, the IRIN harvests common enterprise services such as digital notices, correspondences, case management and payment to create operational efficiency and enhance service delivery.

This infrastructure provides enhanced reliability, scalability and agility to handle different demands during various tax cycles, and to allow policy and rule changes to be deployed quickly. It is also integrated with several other systems such as the cloud-hosted Unified Data Platform (UDP) to support data management and analytics. Further integration includes IRAS' centralized digital service platform known as myTax Portal (mTP) that allows all taxpayers to transact with the agency on tax-related matters, and Whole-of-Government (WOG) services to achieve unified and consistent approach across government touchpoints, cost efficiency, data accuracy, security and compliance in keeping with Singapore's government standards.

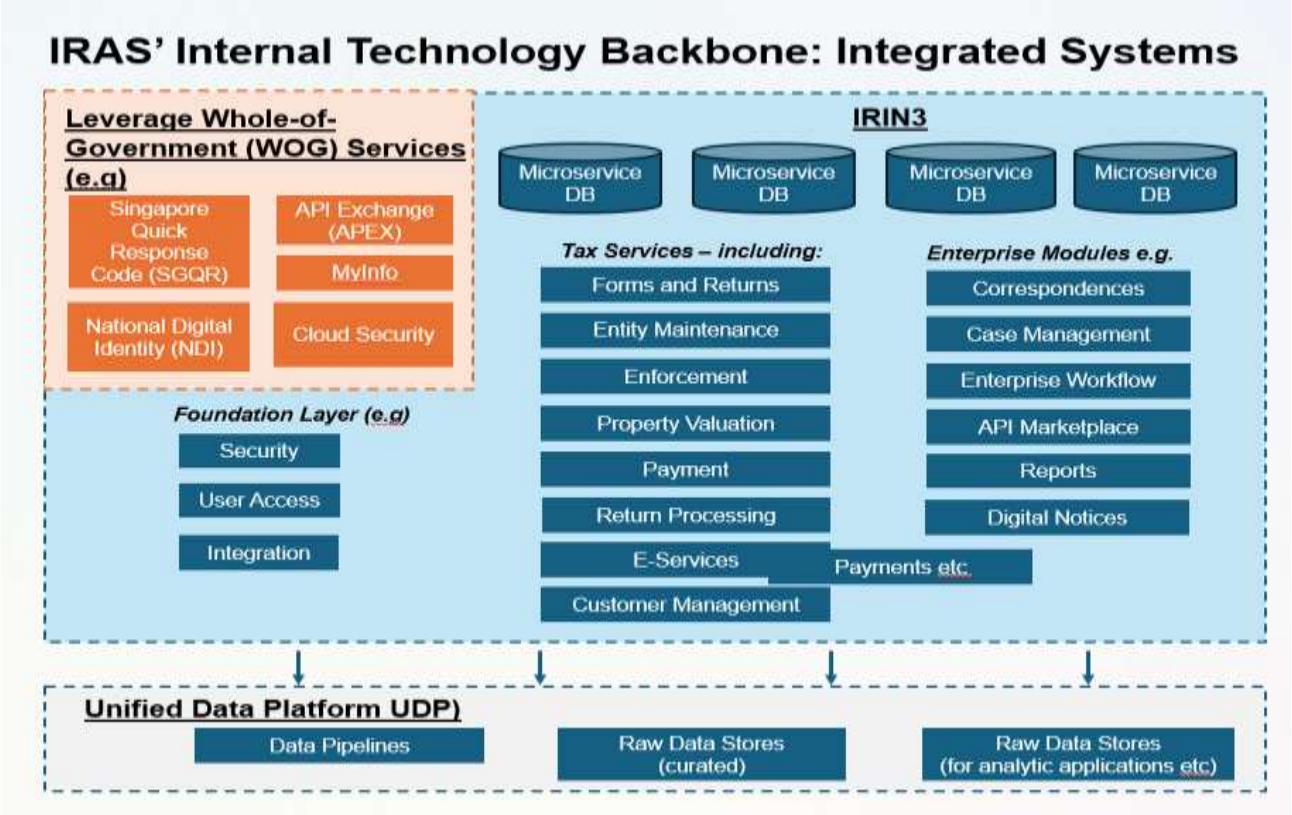


Figure 1: IRAS' Internal Technology Backbone: Integrated System (Source: IRAS)

The list below provides more detail on specific business modernization initiatives related to property tax property/assessment and administration:

1. **Automated Valuations Models (AVMs):** used widely to support property valuations, specifically for homogenous property types such as high-rise residential, office and industrial properties. E-stamping records, that carry lease related details are ingested into IRIN (database) and UDP for advanced data analysis and to produce annual values (AVs), before being affirmed by valuers/appraisers. The AVM allows staff to focus on other higher-value work, unique and complex cases.
2. **Straight-Through Assessment Models (STA):** used for strata-titled retail properties and private commercial shophouses where assessed values are automatically adjusted without human intervention, upon receiving latest tenancy information from e-stamping for stamp duty and fulfilling a set of stringent business rules.
3. **Geographic Information System (GIS) technology:** Use of GIS technology to improve the efficiency and robustness of the valuation process. Beyond using the GIS platform to support visualization through dashboards, interactive and heat maps, the property tax department has incorporated advanced spatial analytics into some of the valuation models for more accurate prediction of values.

4. **Artificial Intelligence (AI) & Machine Learning:** AI and machine learning for purpose of determining assessed values are currently being explored for residential properties and other properties like private shophouses where there are limited market transactions.
5. **API Marketplace:** delivers digital transformation and optimizes tax-related services and transactions with business customers. IRAS has a marketplace for the business community to subscribe to a list of APIs. Examples of property tax related APIs are the property tax calculator, property tax account balance enquiry, occupancy status of residential property, property consolidated statement and rental submission (used by large shopping centers).
6. **System as a whole:** broader tax and government ecosystem for internal and external use:

Microservices and systems connectivity enable seamless data sharing across various platforms, creating efficiency, consistent data inputs and timely delivery. These applications/platforms include:

- **MyInfo:** enables customers with secure access to manage and share personal data, streamlining interactions with government agencies, banks, financial companies and beyond.

- **National Digital Identity (NDI):** Singpass and Corppass – serve as authentication systems to allow Singapore residents and businesses to access and transact with government and business services securely and conveniently, while retaining ownership over their personal data.

- **Network File Transfer:** Citizenship status, residency, company registration and address information are shared with IRAS electronically by other government agencies such as the Immigration & Checkpoints Authority (ICA) and Accounting and Corporate Regulatory Authority (ACRA). Likewise, property and ownership information (for public housing) from government agencies such as Building & Construction Authority, Urban Redevelopment Authority and Housing & Development Board are also shared with IRAS regularly.

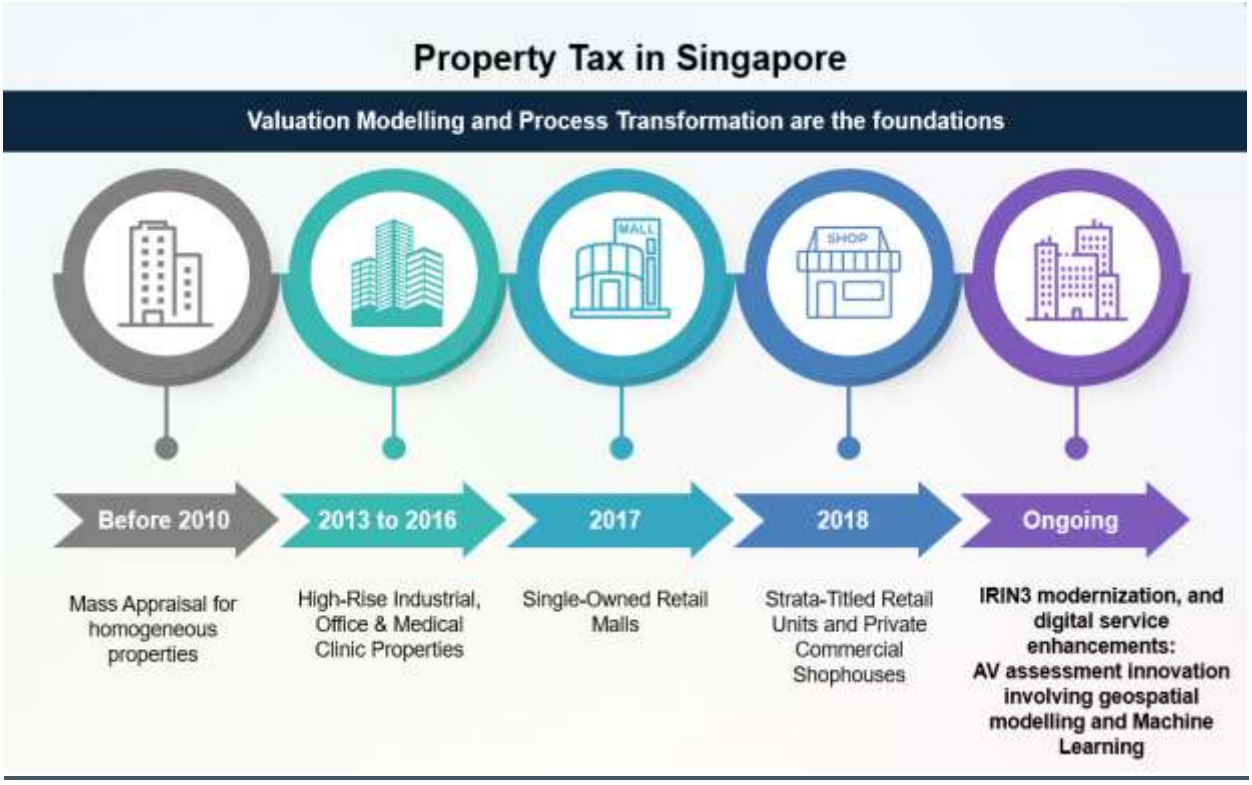


Figure 2: IRAS' Valuation Modelling & Process Transformation (Source: IRAS)

Stakeholder Engagement

IRAS' myTaxPortal (mTP) is a comprehensive, secured and personalized online platform which enables taxpayers to manage their tax affairs digitally. It serves as the primary interface for individuals and businesses to access tax information, make payments and interact with digital services hosted within mTP. The portal integrates with Singapore's digital government infrastructure, using NDI for authentication and MyInfo for data pre-population. It also connects to IRIN to provide real-time tax information and services. Examples of property tax digital services include property summary with past assessed values; view and download notices; apply for exemptions/reliefs; file objections to property assessments; and manage payments (see Figures 3 to 6). Taxpayers can also liaise with IRAS through myTax Mail, a secure digital mailbox system within mTP, to send messages and documents to IRAS or for IRAS to contact taxpayers (see Figure 7).

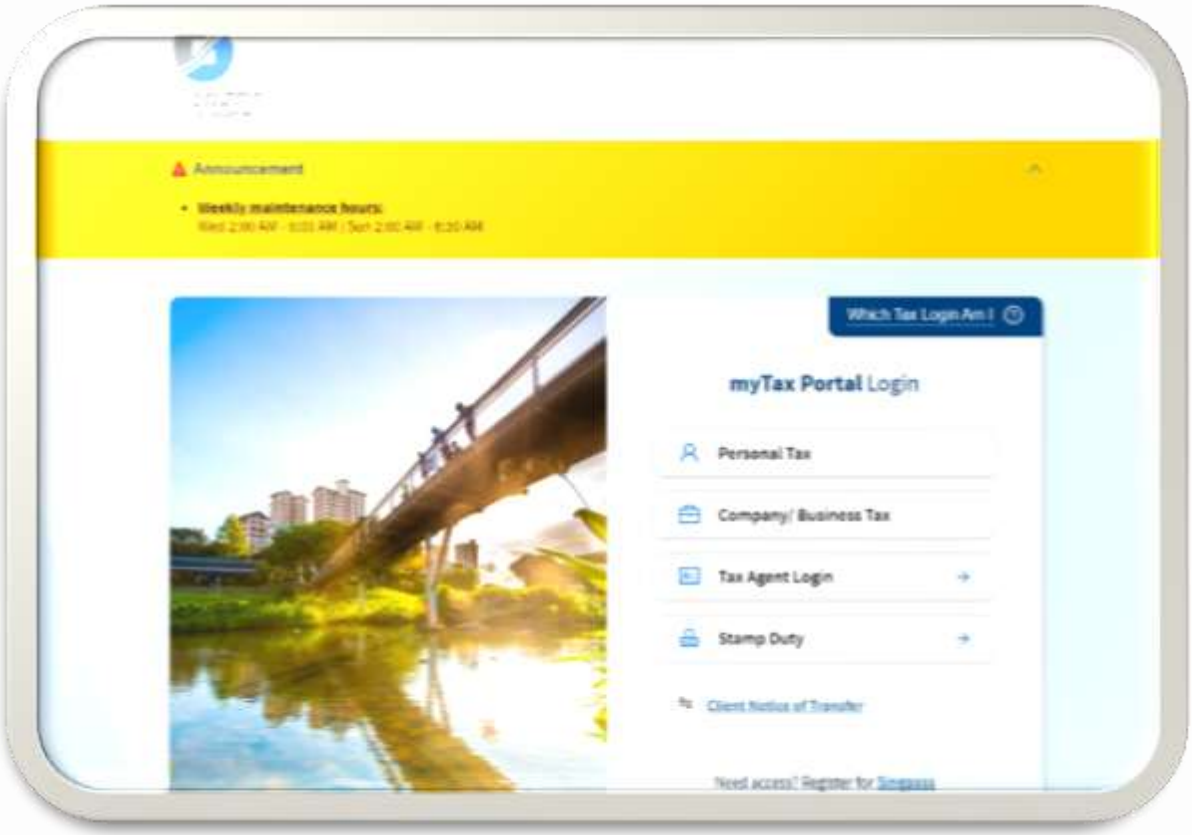


Figure 3. myTax Portal

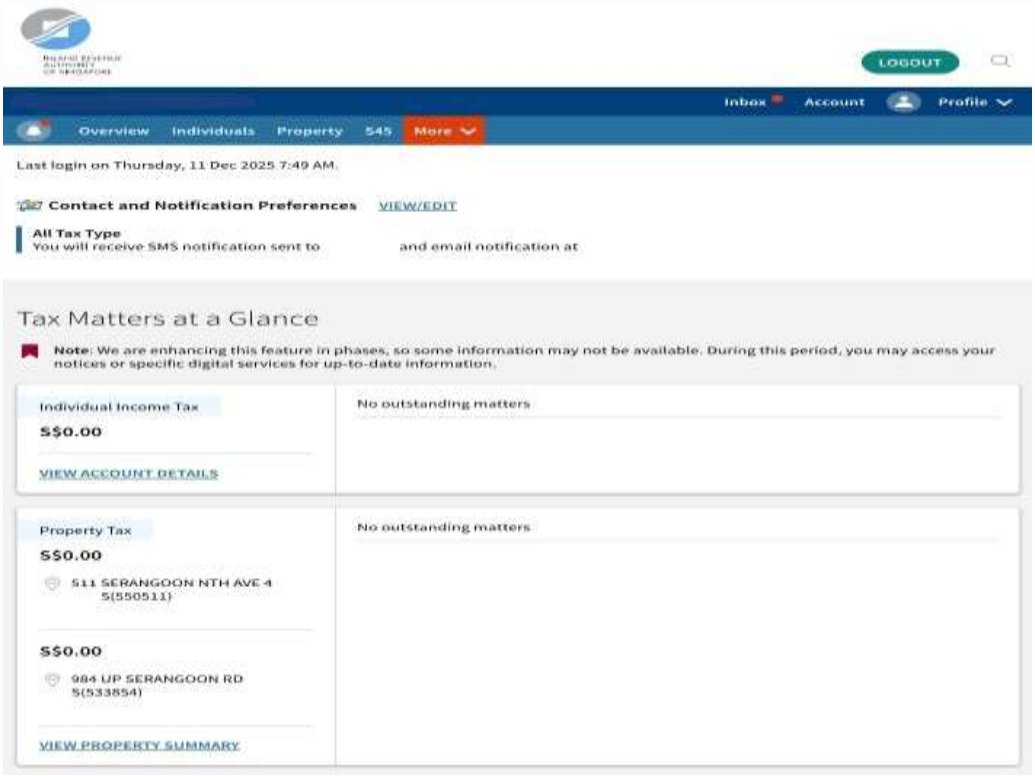


Figure 4: myTaxPortal Landing Page (Source: IRAS)

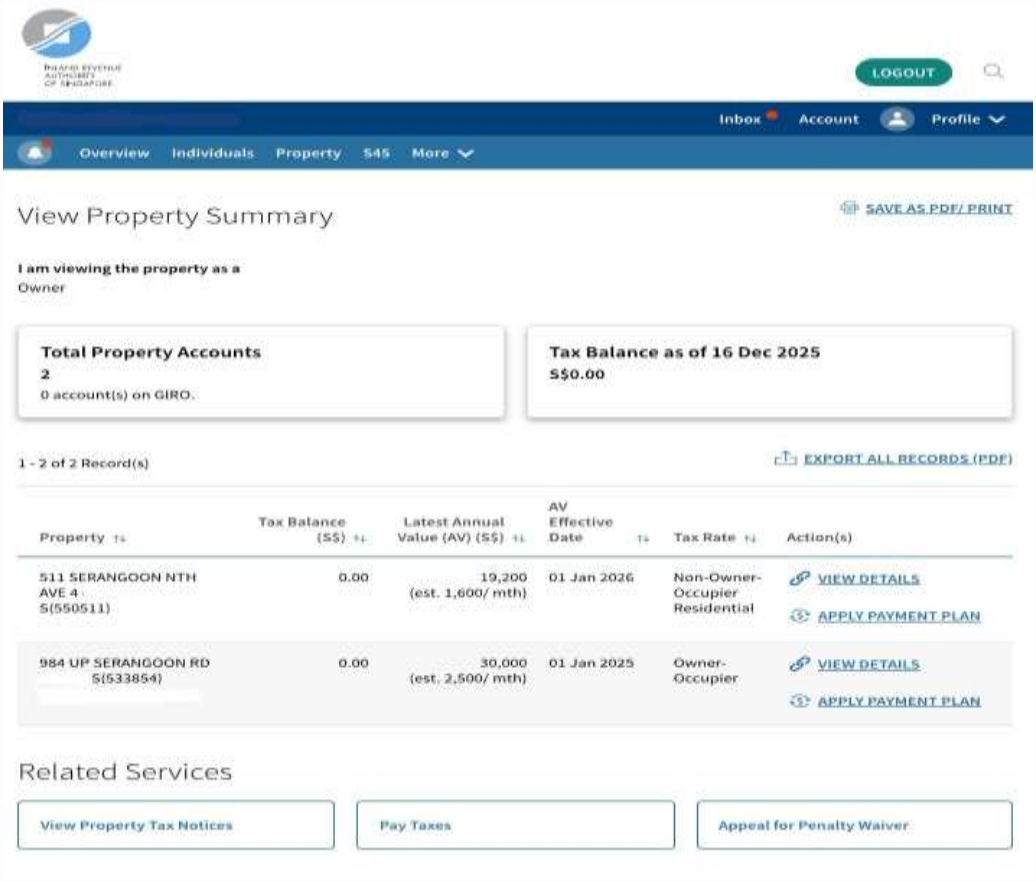


Figure 5: View Property Summary digital service within myTaxPortal (Source: IRAS)

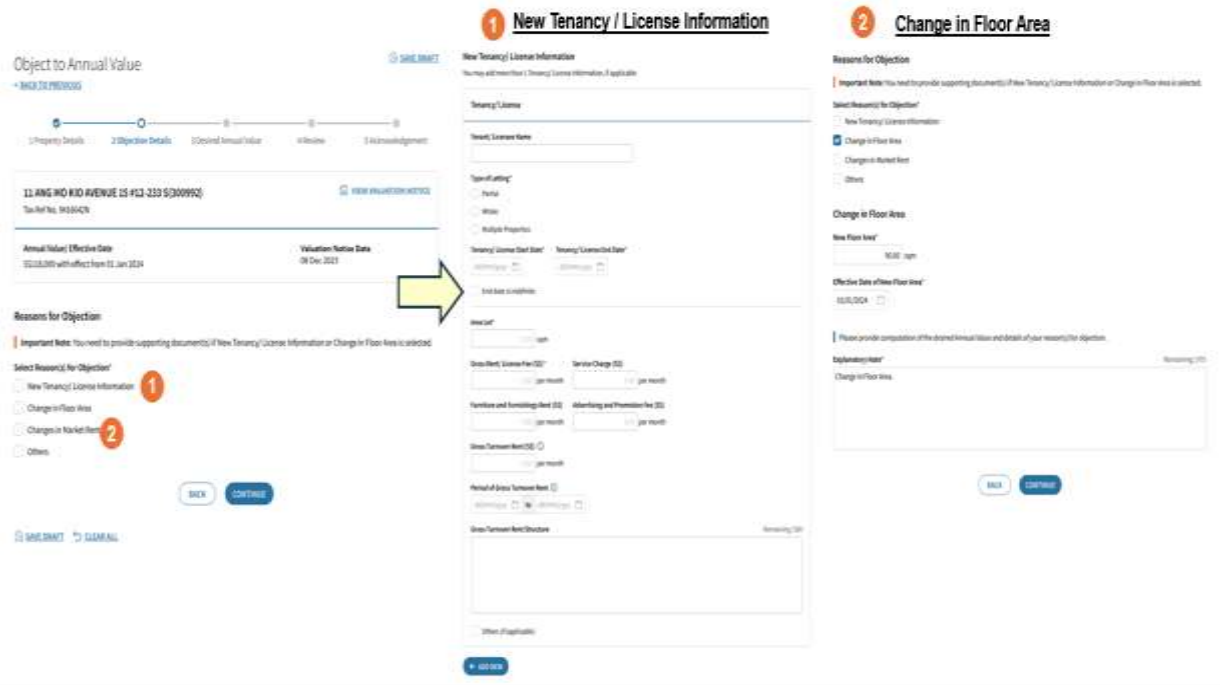


Figure 6: Object to Annual Value digital service within myTaxPortal (Source: IRAS)

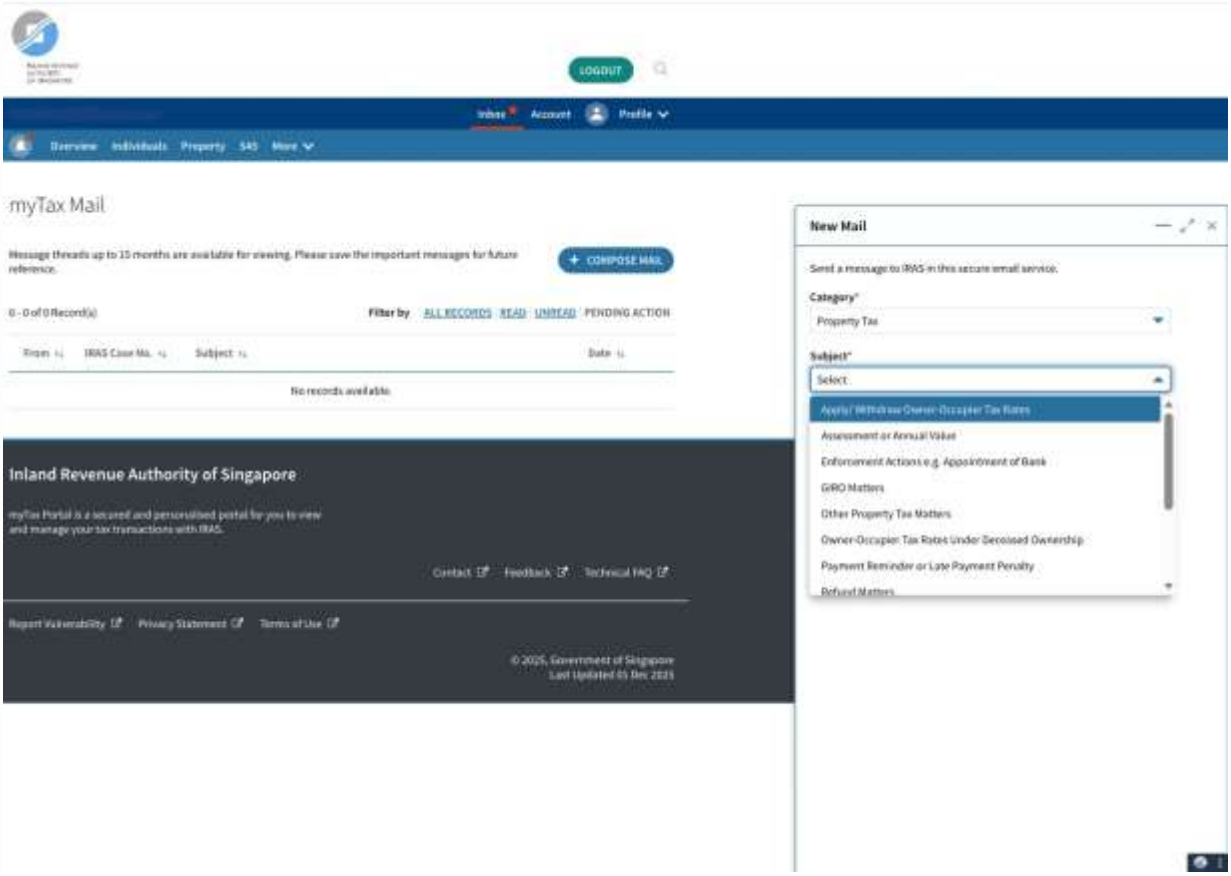


Figure 7: myTax Mail digital service within myTaxPortal (Source: IRAS)

Other key platforms that IRAS engages taxpayers with is through the IRAS website and Taxpayer Service Centre. Comprehensive tax information and certain un-authentication digital services are hosted on the website. AI/Machine learning and data analytical tools are being leveraged to provide tailored content and customize the online experience based on taxpayer profile leading to an enhanced experience.

Examples of these tools are: chatbots to answer common queries on tax matters and perform secure transactions; automated email responses to improve readability of emails and productivity of staff; GenAI search tool to help frontline staff attending to phone calls to obtain relevant answers to tax enquires quickly as well as an internal call volume prediction tool to manage workload and resources.

In every organization, staff are a key stakeholder group. IRAS has implemented a comprehensive change management program to ensure successful implementation of technologies or systems and in-person and e-learning platforms for staff to upskill. IRAS has invested in data analytics and AI-enabled skills development and profiling whereby every employee (including valuers/appraisers) has a "skills portfolio account". They can access skills needs and job adjacencies to facilitate professional development and job rotation. This also drives ownership of the acquisition of necessary and "future" or "technology essential" skills.

Future planning

As the future of tax administration continues to evolve, IRAS is embracing new technologies to transform the organization. Some of the immediate focus areas include:

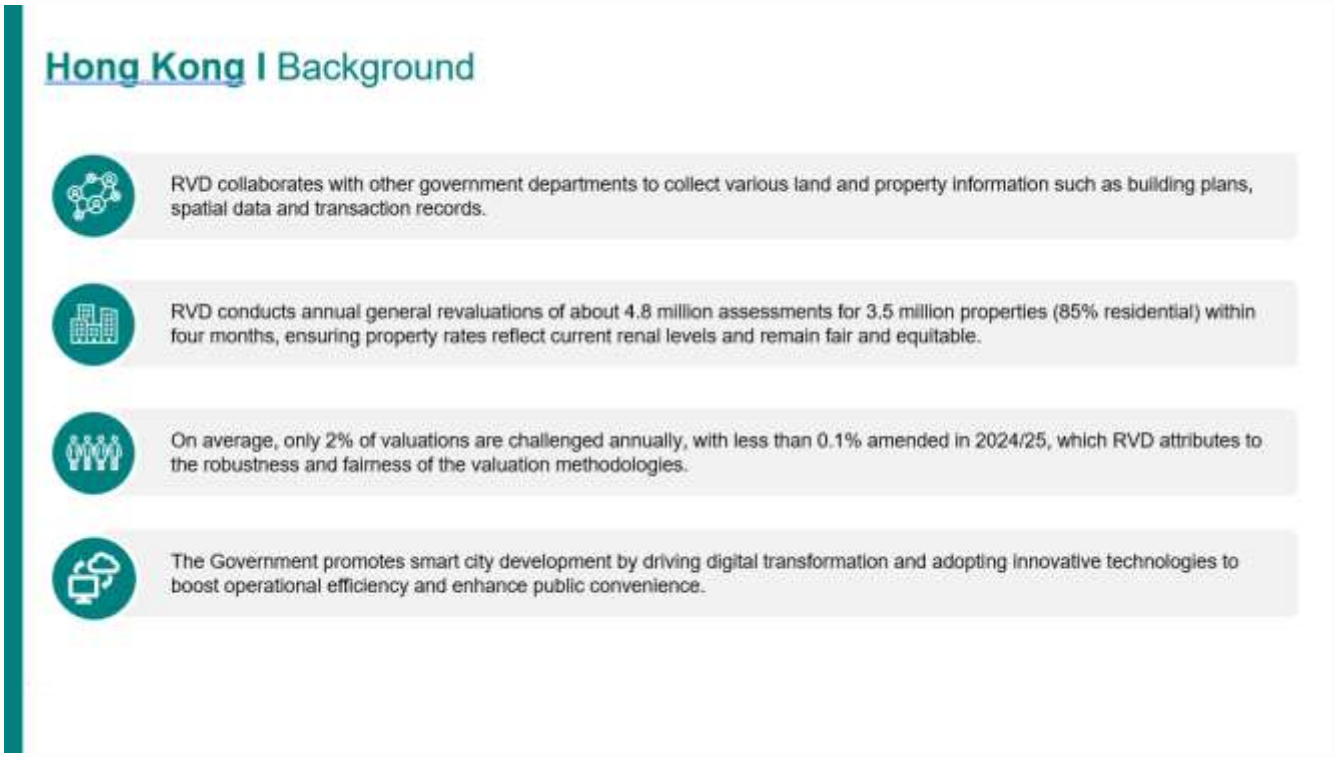
1. Greater exploration and implementation of AI/machine learning to support service delivery (e.g. advanced Digital Human powered by Virtual Intelligent Conversational Agents to manage routine enquiries and seamless transition to human video conference support when necessary, and integration of voice bot technology to deliver consistent 24/7 service). With respect to property valuation, efforts will be focused on computer visioning to analyze property images and AI to manage and analyze property and rental data, predict property values for different property types and generate valuation reports.
2. Scaling up the use of geospatial technology for more robust property assessments through automated workflows, network and spatial analysis.
3. Focusing on quality data as an integral component to support AI/machine learning implementation.
4. Strategic planning includes workforce re-skilling and upskilling.

Hong Kong

The Rating and Valuation Department (RVD) of Hong Kong is a government department responsible for assessing and collecting rates and government rent for all landed properties in Hong Kong. It also provides professional valuation advice to other government departments, maintains comprehensive property records and monitors property market trends.

The RVD assesses 3.5 million properties on an annual basis. Of the 3.5 million, 85% of properties are in the residential segment. The remaining are non-residential which includes commercial properties.

Organizational Context:



Current Use of Technology and Business Process Modernization

RVD has implemented comprehensive digital transformation initiatives to enhance the efficiency, accuracy, and transparency of its valuation processes. This includes the integration of advanced technologies across all stages of the valuation assessment cycle and the re-engineering of business processes to align with e-government objectives.

Digital Tools and Platforms:

- **Web Portal & Electronic Forms**: Secure, cloud-based systems with digital authentication and robust cybersecurity measures allows the public to submit property information conveniently and safely.
- **Data Integration**: Collaboration with government departments enables access to various land and property information including building plans, spatial data and transaction records.
- **Imagery & Geospatial Technologies**: These technologies are used to facilitate data collection and referencing work for assessment of properties in remote areas.

Analytical Capabilities:

- **Spatial Analytical Platform (implemented in 2024)**: A one-stop solution that integrates data and information into interactive dashboards, enabling advanced location intelligence and dynamic data visualization. The platform supports online assessments and streamlines reviews, delivering actionable insights and empowering more effective, data-driven decisions-making.

Valuation and Quality Assurance:

- **Automated Valuation Models (AVMs)**: AVMs with supervised Artificial Intelligence (AI) mathematical algorithm and in-depth analytics have been extensively applied to the valuation of properties that are more homogeneous in property attributes and valuation characteristics e.g. residential, offices, industrial, commercial properties, enabling staff to systematically assess large numbers of properties in a short period of time while ensuring accurate and consistent valuations.
- **Internal Audit Unit (IAU)**: Conducts audits throughout the valuation cycle to ensure compliance with international standards and identify priority areas for review.

Business Process Re-engineering (BPR):

- RVD has restructured its workflows to improve operational efficiency, reduce paperwork, eliminate geographical barriers, and improve data sharing.
- Key examples include the Spatial Analytical Platform (outlined above) and Web Portal (covered under Stakeholder Engagement below), which has streamlined the processing of applications and communications with business payers.
- Challenges include change management, legacy data migration, and budget constraints.
- Success depends on stakeholder engagement, leadership support, staff training, and phased implementation.

Demonstrated Effectiveness

- In 2024, RVD completed 4.8 million assessments for over 3.5 million properties within four months.
- On average, RVD receives less than 2% of objections to their valuation. Less than 0.1% of assessments are altered after objection reviews, which RVD attributes to a robust and fair valuation methodology.

Stakeholder Communications

RVD has prioritized inclusive, efficient, and transparent communication with stakeholders through a range of digital tools and engagement strategies.

1. Multi-Channel Digital Access

- Platforms include:
    - RVD Website (central hub)
    - Property Information Online (24/7 access to property data) – see Figure 8
    - eRVD Bill (for electronic billing)
    - e-Forms (for form submissions) – see Figure 9
    - Online Progress Tracking Facility (for case progress tracking)
    - Web Portal (for objections, notices, and business payer communication)

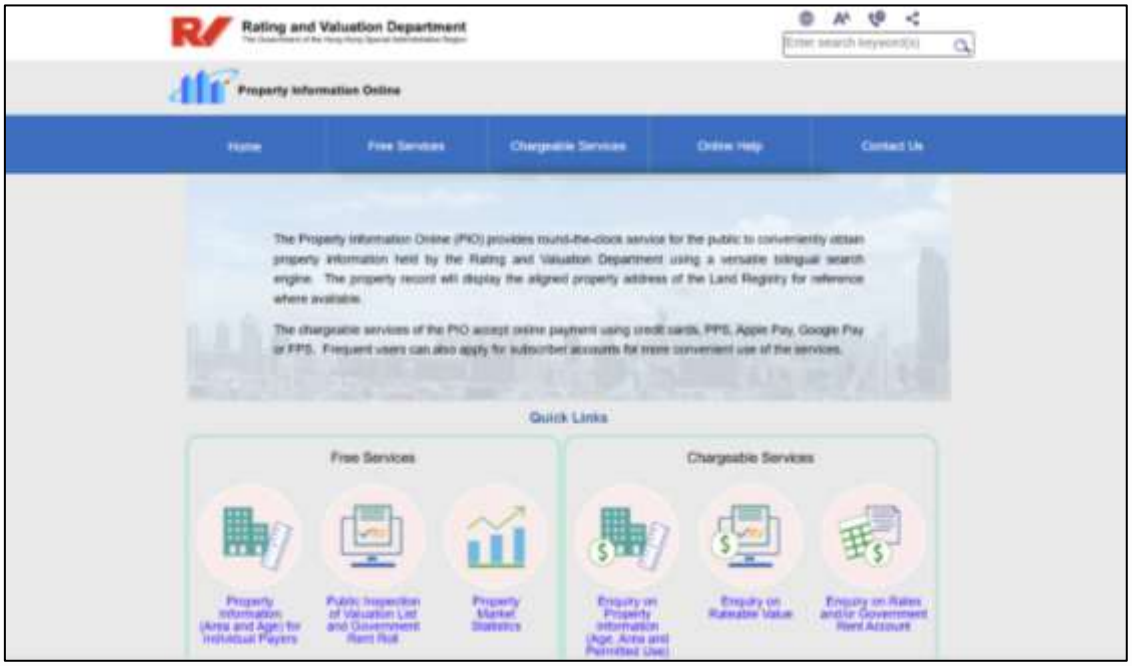


Figure 8: Property Information Online (Source: RVD)

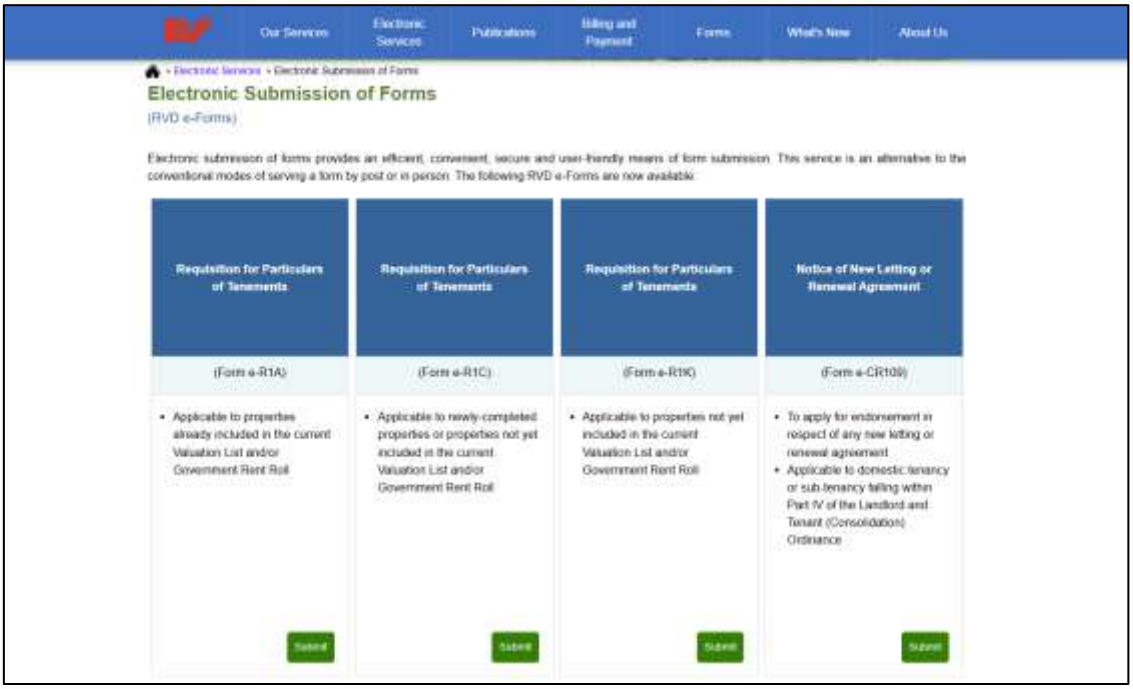


Figure 9: Electronic Submission of Forms (Source: RVD)

Enhanced Service Delivery

- The Web Portal supports:
    - Authenticated access via single digital identity, allowing users to access multiple platforms with their citizen ID card, eliminating the need for multiple login credentials for various platforms.
    - Automatic form prefilling
    - Paperless workflows and timely responses
    - Public access to property data and statistics 24/7
- e-Bills include QR codes for instant payment through all available methods.

Customer Feedback and Satisfaction

- A feedback mechanism allows users to rate services and provide comments.
- Insights from feedback are used to improve service delivery.
- Uptake of digital services continues to grow with increased use of e-billing and online submissions.

Digital Inclusion

- RVD promotes accessibility through:
    - Multilingual interfaces (including ethnic minority languages)
    - Compliance with Web Content Accessibility Guidelines (WCAG)

- Braille demand notes for the visually impaired
- Redesigned demand notes (in 2025) for improved user-friendliness

Future Planning

RVD is committed to continuous innovation and strategic planning to support evolving business needs and enhance public service delivery. This includes development of the following initiatives:

AI and Automation

- **AI Chatbot**: Under development to provide prompt responses to public enquiries.
- **AI + Spatial Modelling**: A proof-of-concept is underway to explore the use of AI and spatial statistical modelling in property valuation to study the feasibility of enhancing valuation accuracy, efficiency and scalability.
- **GenAI Applications**: Proof-of-concepts are underway to leverage machine learning and large language models for address parsing and matching, intelligence character recognition, AI agent for enquiries handling, case processing and report drafting, etc.

Workforce Development

- Staff are being upskilled through training in AI and machine learning to prepare for future technology integration.
- RVD employs the concepts of "Smart People" and "Digital Government" which reflect broad government initiatives that focus on empowering RVD officers to work more intelligently and effectively by integrating advanced technologies and workflow digitalization into core business processes. This helps improve efficiency and accuracy and promotes broader adoption of modern technologies across RVD's other core businesses. This aligns with the government's strategic initiative of delivering more user-centric e-public services.
- A knowledge management portal supports internal learning and communication.

Strategic IT Roadmap

- A new departmental IT strategy is being developed to guide medium-term digital transformation. The strategy aims to modernize capabilities and explore improvements to align with e-Government initiatives.
- The strategy will explore the use of:
    - PropTech
    - Artificial Intelligence
    - Cloud computing
    - Big data analytics
    - Location intelligence
    - Building Information Modelling (BIM)

Conclusions

Both IRAS and RVD have made significant progress in modernizing business processes through digital transformation, automation and user-centric services. IRAS demonstrates advanced integration with other government platforms, API driven services and a robust cloud and microservices architecture. Its use of automated, geospatial analytics and early exploration of AI for property valuation reflects a robust digital strategy.

RVD has achieved notable success in scaling digital services and implementing advanced AVMs with supervised AI tools for mass appraisals annually, while embedding transparency and inclusivity into its customer service delivery. RVD demonstrated how advanced technology, high quality data management and customer centric design can be robustly integrated into its valuation systems to meet the ever-rising needs and expectations of taxpayers. Both jurisdictions recognize the critical role of data quality, workforce upskilling and digital engagement as enablers of future innovation. Their strategic plans are focused on AI, automation and geospatial technologies, reflecting a shared ambition to create resilient, data-driven valuation systems.

Challenges such as legacy data migration, maintaining data integrity, managing organizational change and sustaining innovation remain critical considerations. The key insight is that future success will depend on a balanced approach that combines technology investment with strong governance, user-centric design and continuous capability development.

Recommendations

Based on the analysis of findings, the following strategic recommendations are proposed to support transformation and future-readiness within valuation agencies:

1. **Accelerate AI and Automation:** To enhance operational efficiencies and keep pace with the rapid technological advancements, valuation agencies should identify opportunities to embed AI and machine learning across key functions. This includes predictive valuation models, anomaly detection and customer service enhancements. Advanced applications, such as computer vision for property image analysis and predictive modelling for rental and market trends, should be explored. Success will depend on access to high-quality data and the implementation of robust, transparent AI governance to uphold public trust.
2. **Strengthen Data Foundations**: Establish a unified data governance framework to standardize property data sharing across systems and government departments. Invest in data quality initiatives, including data cleansing legacy data and implementing real-time validation processes. Prioritize API-driven integration across valuation, tax and government systems to enable seamless, secure data exchange.
3. **Enhance Digital Service Experience**: To deliver more responsive and user-centric services, agencies should develop intuitive and accessible digital platforms featuring personalized dashboards, predictive service tools and real-time feedback. Expanding self-service capabilities and integrating AI-powered chatbots and virtual assistants can provide 24/7 support and improve customer experience.

4. **Invest in Workforce Transformation:** Introduce structured reskilling/upskilling programs focused on data analytics, AI and digital service delivery. Support staff through digital literacy and change management initiatives to build confidence and foster adoption. Establish clear career pathways aligned with emerging technology roles to retain talent and future-proof the workforce.
5. **Embed Continuous Innovation**: Develop a strategic IT roadmap aligned with broader government initiatives and sustainability goals. Foster partnerships with other valuation agencies, PropTech firms, academic institutions and industry to co-create solutions and share best practices. Promote iterative improvement through regular technology reviews to drive long-term transformation.

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