2018 URISA® EXEMPLARY SYSTEMS IN GOVERNMENT (ESIG™) AWARD SUBMISSION
2018 URISA® Exemplary Systems in Government (ESIG™) Award

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June 4, 2018

URISA
701 Lee Street, Suite 680
Des Plaines, IL 60016

Dear Members of the Review Team:

2018 URISA Award for Exemplary Systems in Government (ESIG)

As Assessor of the County of Los Angeles, I am pleased to authorize the attached submission for the 2018 URISA Exemplary Systems in Government (ESIG) Award under the Enterprise Systems category for implementation of our new Assessor Portal.

I am confident this Portal demonstrates that my Office meets all of the URISA ESIG Award criteria and has improved the delivery and quality of property assessment through the application of geospatial technology.

Thank you in advance for your consideration of this submission. In the meantime, should you have any questions or require additional information, please do not hesitate to get in touch.

Sincerely,

JEFFREY PRANG
Assessor
A. SYSTEM

1. Name and Category

System Name: The Assessor Portal
ESIG Category: Enterprise Systems

2. Letter from the Executive Administrator
(See Attached)


The Los Angeles County Assessor’s primary system of record is a legacy system consisting of a mainframe built with 1970’s technology that is now over 30 years old. It contains cryptic historical codes, keys, acronyms, and other semantic references that users must either memorize or look up in manuals. This legacy system provides limited search functionality with numerous “green screen” interfaces that are difficult to navigate and comprehend even for more experienced staff members. It cannot readily interface with the Department’s document management system, file scanning initiatives, or other modern yet silo’d applications which requires staff to separately navigate numerous independent systems. Seemingly trivial modifications and enhancements are so problematic that the system has not been significantly altered since its inception in 1983.

The Assessor’s Office was in the initial planning stage for its Assessment Modernization Project (AMP) that would eventually replace this legacy system. The project was estimated to take six or more years to complete, not including the one or two years needed for planning, approvals, and procurement. The Department felt the need to accomplish small yet significant improvements immediately in order to provide desperately needed system enhancements, demonstrate project management and agile software development competency, and most importantly to begin the significant change management process that AMP was anticipated to face.
COUNTY OF LOS ANGELES OFFICE OF THE ASSESSOR

EXISTING LIMITATIONS:

- 1970’s Technology
- Limited Search
- Poor Navigation
- Cryptic Codes & Keys
- No Reference to Location
- Device Dependent - No Mobility
- Lack of Scalability - No Change

The Solution: “The Assessor Portal”

The Assessor’s Office created an interface, called the Assessor Portal, which provides legacy assessment information in a modern, friendly, and intuitive environment. This interface solved some immediate needs while the Department began planning for the long-term replacement of the legacy system.

In contrast to the green screens, the Assessor Portal provides an overall superior user experience by placing assessment information on one convenient interactive page while employing modern responsive web design for viewing information on desktops and mobile devices.

The Portal delivers enhanced search and navigation that allows staff to search by parcel number, address, owner name, legal description, cross streets, place names, by panning and zooming to a location on a map, or by simply touching the now commonly used locator icon while standing on or near a property.

Although data still originates from the legacy system, the new Portal displays tooltips and expandable sections throughout the site with translation of all obscure codes and keys into simple English.

Best of all, the Assessor Portal features Google Street Views of the property, EagleView/Pictometry oblique multidirectional imagery, modern and interactive GIS mapping functionality, three geocoding services that add over a million additional searchable locations, and over twenty thematic layers related to location-location-location that the legacy system simply cannot provide.
A common goal was to have as much information as possible in one location without the need to navigate multiple applications or modify existing applications that were satisfying the Department’s needs. To meet that goal, the Assessor Portal interfaced with the Department’s document management and file scanning initiative. The Department previously completed the scanning all of the 2.4 million parcel files which contain an estimated 10 million pieces of paper.

The Assessor Portal provided a simple interface to those documents and scanned images while the long-term document management interface was developed and deployed. In addition, the Portal provides information from several of the Department’s silo systems in the form of convenient links, or as ingested data, that appears as one transparent system to end users. For example, clicking on a document number opens an image of the deed and change-in-ownership-statement stored in the Assessor’s title system, while a tab displays city building permits ingested from the Department’s historical permitting system.

Pictometry’s CONNECT Explorer “pass-through” API was leveraged to provide staff with the rich GIS functionality that is expected of a modern assessment system, such as side-by-side imagery and various measurement tools, without having to build that functionality from scratch.

The Portal is also shared with all other County Departments. The Assessor relies on the Registrar Recorder for deeds and other recorded instruments, Public Works for building plans and permits, the Auditor for billing information, the Tax Collector for payment and delinquency information, and the Assessment Appeals Board for appeal information.

Sharing the Portal has opened opportunities for better collaboration and information sharing across multiple departments that is rarely experienced in local government operations. Most significantly, a lightly redacted version of the Portal is available to the general public which is viewed by over 4,000 people per day with a combined audience of over one million users from 95 countries since inception.

Initially, The Assessor Portal was conceived, designed, built, and released in roughly four months followed by the release of monthly agile enhancements over the following five months. The nine-month project was one of the most compressed yet influential projects in the Department’s history.
NEW BENEFITS:

- Modern “Responsive” Interface
- Enhanced Search Options
- Simple Navigation
- Translation of Codes & Keys
- GIS and Mapping Capabilities
- Device Independence - Mobile

The public version of the Assessor Portal is accessible online by visiting portal.assessor.lacounty.gov. A sample parcel number is 2004-004-004, or feel free to pan, zoom, and click using the “Map Search” tab.

4. User Testimonials:

“When you are doing field work, you may get only one opportunity to talk to the property owner and if you don’t have all the necessary information, you may miss something important. Having field access to the Assessor Portal is important, whether it’s for referencing aerial imagery, looking at recent sales information, or simply viewing property information from the Assessor’s database.”

Kurt Vangsness, Appraiser Trainee
Los Angeles County Assessor.

“The Assessor Portal has been a crucial daily tool in helping me to complete my work. For years, our office had been using an archaic system that displayed property information in codes and keys that were hard to understand. Now I am able to view updated, easy-to-read data alongside electronic parcel documents, tooltips, Google street views, and other related maps and links...right there at my fingertips!”

Kimberly Jackson, Appraiser
Los Angeles County Assessor.
“The portal has been a great addition to our resources at the public counter! It makes it easier to help the public, since all the basic information is there, and that information is much easier to read and understand than the previous system. It has also helped reduce the amount of visitors to the counter, since many people are now aware that this is a public portal that can be accessed from the Assessor’s website.”

Luis Tobon, Public Service Representative
LA. County Treasurer Tax Collector

B. JURISDICTION

Name of Jurisdiction:
County of Los Angeles Office of the Assessor

Population Served by the Agency:
Over 10 million

Total Annual Budget for Jurisdiction:
$120 million

Name, Title, and Address of Chief Elected Official:

ASSESSOR JEFFREY PRANG
Office of the Assessor
Kenneth Hahn Hall of Administration
500 West Temple Street, Room 320
Los Angeles CA 90012

Name, Title, Address, Telephone, and Email for System Contact Person:

JAMES KULBACKI
Principal Appraiser Mapping and GIS Services
500 West Temple Street, Room 325
Los Angeles CA 90012
Phone: (213) 893-2186  |  Email: jkulbacki@assessor.lacounty.gov
C. SYSTEM DESIGN

What motivated the system development?
The existing core legacy system of record consists of a mainframe built with 1970’s technology that is now over 30 years old. It contains cryptic historical codes, keys, acronyms, and other language that users must either memorize or look up in manuals. It has limited search functionality, contains numerous “green screens” that are difficult to navigate and comprehend for even the most experienced staff members, cannot interface with other department information assets, and has little reference to location.

What specific service or services was the system intended to improve?
Eliminate the need to look up codes and keys in manuals or commit that information to an individual’s memory, simplify navigation, modernize the user experience with responsive design for mobility, enhance search functionality, and provide the mapping and GIS capabilities that a modern assessment system is expected to provide.

In addition, the Portal would provide a single interface to the multitude of silo applications created over the past several years until a long term solution could be planned and implemented. Finally, the Portal would greatly improve public service by providing public access to the entire contents of the Assessor’s property database, with only a few required restrictions.

What, if any, unexpected benefits did you achieve?
Other County Departments were initially more excited and interested in the application than most senior Assessor staff primarily due to change management issues. This opened a dialog for communication and data sharing across several departments. The project also allowed us to offer the new Portal side-by-side with the legacy “green screens” so staff could gradually acclimate to this new way of interacting with information needed to perform their duties. This assisted in the difficult change management process necessary for long term transitional planning. Unsurprisingly, the newest members of the Department quickly embraced the new system, while surprisingly, the more seasoned senior staff warmed up to the new system quicker than mid-career personnel.

What system design problems were encountered?
Moving from familiar green screen interfaces to an unknown future state that was initially only envisioned as modern, interactive, and responsive was difficult for the projects SME’s and developers to conceptualize. An agile and iterative participatory design process that involved an initial needs assessment, scenarios, personas, and mockups was not something that the development team was familiar or comfortable with. After several iterations, the team was able to...
articulate needs in the form of user scenarios that took into consideration various personas including those from other departments and the general public. Interface mockups soon became working prototypes that were evaluated and adjusted on two-week sprint intervals. The vision evolved into a design process that evolved into a design. Some physical design considerations were afterthoughts until initial deployment and testing began. Performance related to the search of over 100 million records, along with related page load time, had to be iteratively tested and tuned.

Combinations of hardware adjustments and software tuning, such as adding memory and processors, adjusting database indexes, and modifying query services eventually resolved performance issues. Page load time was reduced from around 30 seconds to less than 3 seconds on average.

**What differentiates this system from other similar systems?**

Similar systems tend to be overly focused on mapping functionality rather than a balanced view that combines traditional content with modern mapping functionality. The Assessor Portal’s balanced approach satisfies end users desire for content while also providing targeted interactive mapping functionality.

In addition, similar efforts have typically only provided information for current points in time rather than the entirety of available electronic assessment history that is provided by the Assessor Portal. For example, there are many applications around the country built with ESRI’s Web AppBuilder or Latitude Geographic’s Geocortex product that fall short of what the Assessor Portal offers in terms of functional diversity and data completeness.

Also, interfacing with existing systems allowed us to continue using what has worked for us while providing a single access point, or view, into those systems without “reinventing the wheel” as the saying goes. Finally, Assessor business staff were embedded in the project as Project Owners and Subject Matter Experts (SME) in order to engage in the participatory design and decision making that was needed to ensure a successful project.
D. IMPLEMENTATION

What phases did you go through in developing the system?
We applied an agile/scrum approach to the systems development process which operated in two-week internal development sprint cycles. After four months, we released the first version of the Portal to Assessor staff followed by monthly releases that introduced scheduled enhancements and bug fixes until project completion.

The project was completed in nine months after roughly five release cycles. We then opened the Portal to other County Departments, followed by release of a public version which simply redacted non-public content and removed access to internal applications due to licensing or other privacy considerations.

Were there any modifications to the original system design? Why? What?
The initial design process mentioned earlier led to several radically different initial designs. Once the team could conceptualize and visualize a future state, the design process led to a semi-solid design concept that was still fluid. From that point, the design evolved into a solid concept were only minor screen layout and navigation was adjusted as feedback was received from users after each release. Additional map layers and other content were created or acquired for subsequent release after requests from staff.

Demonstrations were provided and a SharePoint survey was conducted after the first release in order to gather user feedback, re-evaluate user needs, prioritize content and functionality for future releases, and to simply serve as a checkpoint as part of the change management process. Traditional training was provided after full implementation and included optional video tutorials for those that could not physically attend training sessions.
E. ORGANIZATIONAL IMPACT

What user community does the system serve and how?
The County Assessor’s staff was the primary target audience for the purpose of providing assessment information for regular day-to-day operations. However, inclusion of staff from other departments, and the general viewing public, was also considered from inception without directly involving those audiences in the design process.

At least seven other County Departments subsequently benefited by utilizing the new Assessor Portal in their day-to-day operations including the Auditor Controller, Treasurer Tax Collector, Registrar Recorder, Regional Planning, Public Works, Consumer Affairs, and Social Services. Over 500 combined staff from various Departments access the Portal on a daily basis. The public version of the Portal serves over 4,000 members of the general public every day by providing assessment information for over 2.4 million properties in Los Angeles County.

What are the ultimate decisions, operations, and/or services affected? If appropriate, provide a few examples including, but not limited to: screen input/output forms, paper products, or other descriptive graphics.
The Assessor Portal serves primarily as an information outlet that provides assessment information for all 2.4 million properties in Los Angeles County. It also provides content from Assessor ancillary systems, or seamlessly interfaces with those systems, without having to separately navigate, authenticate, and search those systems. The Portal also provides new information in the form of interactive maps, over 20 thematic layers, enhanced geocoding for searching a map by address, Google Street Views of property, EagleView/Pictometry oblique imagery integration, and GIS tools that provide measuring and other common GIS functionality for internal users.
Screenshot of the Assessor Portal’s Homepage:

Property can be searched by entering a parcel number, address, owner name, or legal description if known. Selecting the “Map Search” option will lead to the interactive and searchable map displayed below. The map search offers an additional one million searchable addresses, as part of L.A. County’s dual geocoders that are not stored in the Assessor’s property database.
Screenshot of the Assessor Portal’s “Map Search” page:

LA. County’s dual geocoders allow you to search by entering a parcel number, address, cross-streets, or a landmark in the search box. ESRI’s world geocoder serves as a backup search option. When viewed from a mobile device, users can simply touch the locator icon to find the property they are currently at. Traditional panning and zooming can also be used to find a property or to simply observe surrounding features. Once a property is identified, simply click or touch the parcel to obtain detail for that property. Over 20 thematic layers provide helpful assessment related themes.
Screenshot of the Assessor Portal’s primary interface demonstrating information for a single property. Over 30 years of assessment history is presented on one convenient interactive page.
What were the quantitative and qualitative impacts of the system?
The quantitative aspects can be expressed as cost avoidance due to reduced training needs related to the former un-intuitive legacy user interfaces, reduced maintenance of paper reference manuals, reduced need to print materials for field work, elimination of trips to the file room, and reduction in knowledge loss as staff retire.

By connecting the Assessor Portal to Google Analytics, management can also now observe user patterns in the form of site visits, return visits, time spent on the site, pages viewed, usage over time, real time connections, devices and browsers used, location of visitors, indications of user engagement and satisfaction, and even how users tend to flow through the Portal.

Qualitative aspects can be expressed by the overall superior user experience where legacy codes and keys are translated into English, search is enhanced and now includes map and native device location capabilities, and device independence and responsive design aid field workers without the need for paper. In addition, property owners now see what the Assessor sees from a location and time that is convenient for them.

What effect has the system had on productivity?
Staff no longer have to spend time memorizing codes and keys or looking them up in reference manuals. In some instances, staff had to find the person that knew the meaning of legacy information when that information was not maintained in reference manuals. Training efforts are significantly reduced simply by the intuitive interaction and translation of information into English that the Portal provides. Staff no longer have to print volumes of information for use in the field as that information can now be viewed from a cell phone or other mobile device.

Also, there is reduced public service now that property owners can easily access and understand their assessment information without assistance from Assessor staff. Finally, when calls from the public do arrive, the office’s VOIP telephone system automatically pops open the Portal to the property in question for more efficient and effective public service.

What, if any, other impacts has the system had?
It has opened up sharing and collaboration opportunities with other departments that traditionally remained relatively isolated. It has also assisted in the Assessor’s commitment to open data initiatives by exposing nearly the entire contents of LA County’s assessment information to the public.
How did the system change the way business is conducted with and/or service delivered to clients? Give specific examples comparing the old way with the new.

In the past, individuals outside of the Assessor’s Office would come to a local office in order to view assessment information. Most could not understand the Assessor’s 30-year-old “green screens” and required assistance with translating cryptic codes and keys, navigating using strange function keys, and simply finding their target property.

Now they can not only intuitively search and navigate that same information from home, they can simply touch the locator icon on the Portal’s map to identify a property from a mobile device while standing on or near the property. New Assessor staff require less training related to interpreting legacy information; which they would semi-jokingly compare to learning a foreign language.

F. SYSTEM RESOURCES

What are the system’s primary hardware components? Give a brief list or description of the hardware configuration supporting the system.

Virtualized servers that include a data server, web app server, and a server hosting web services are maintained on the Assessor’s network for internal County users.

A replicated environment that sits within a typical DMZ and behind firewalls is hosted on the County’s eCloud network environment for public consumption. Some mapping services are hosted by various 3rd parties including ESRI, the State and Federal Governments, and also EagleView Pictometry. Weekly backend ETL processes are hosted on separate data staging servers. The existing VOIP telephone system, that uses Cisco’s Finesse CTI for call center support, was enhanced to provide a simple screen-pop that opens the Portal to the property in question for efficient customer service. Any device running a modern browser can be used to view the application including desktop, laptop, tablet, or cell phone.

What are the system’s primary software components? Describe the software and, if a commercial package, any customizations required for the system.

HTML5, JavaScript, CSS and a light .Net underlying framework make up the web user interface. The open source Angular JavaScript framework is used to support responsive design and other various interface features. Microsoft’s ASP.net RESTful Web service API provides communication from the interfaces to the databases and to
existing ancillary applications in some cases. Various existing internal and external REST services provide mapping layer and geocoding services. ESRI, Google, and EagleView/Pictometry JavaScript APIs and similar APIs provide various map service functionality and integration.

**What data does the system work with?**

**List and briefly describe the database.**

The system works with a Sql Server database that is loaded by ETL processes each week with data from multiple source systems. The primary source is a 1970’s IMS hierarchical mainframe system that holds assessment data on 2.4 million properties containing 35 years of assessment history with as many as 100 million records in one of its tables/segments.

Ancillary systems that cannot be directly connected to using services or other methods are also loaded into the Portals database using ETL processes (e.g. building permits, parcel change history, etc.). The Portal employs a data warehouse star-schema model for highly efficient query execution, simple maintenance, and easy ETL management.

**What staff resources were required to implement the system?**

Five FTE’s were required for implementation. This included two developers and three business staff that performed project management, SME, and systems analyst duties. Two of the business staff also had technical backgrounds. Additional business and developer resources were leveraged as needed for consultation, subject expertise, or as the project transitioned across phases.

**Comment on anything unusual about the resources used to develop your system, such as data, software, personnel and financing.**

Business staff accepted and performed rolls as SME, project manager, and systems analyst. Two happened to have technical backgrounds and were able to provide technical leadership in reverse engineering of the legacy system screens, new data structure, as well coordinating mapping and GIS functionality that was new territory for the seasoned developers.

Four existing external APIs and 25 existing REST Services were leveraged just for the mapping functionality. This includes APIs from LA County, ESRI, Google, and EagleView/Pictometry along with REST feature services from ESRI, LA County, the State of California, and the Federal Government. The availability of existing service enabled content and infrastructure made rapid and incremental development feasible.