Performance & Innovation Teams: How They Can Help

Auditing the Smart City

Association of Local Government Auditors
September 10, 2019

Almis Udrys
So many questions...

- What is an innovation team?
- What is a smart city?
- Why should an auditor care?
- Who are you?
- Who am I?
Overview
Performance & Innovation Teams: How They Can Help

Processes

Tools

People
What is Innovation?

“Solving the problem of how to do something better than ever”  Mathew E. May (Elegant Solutions)
Starting Change

For innovation to happen, someone has to start thinking and acting differently!
Five Principles of Innovation

1. Identify the value that your customers demand

2. Map the steps required to deliver value to your customers

3. Deliver value to customers on demand

4. Deliver value to customers without waste

5. Seek perfection: standardize and solve to improve
“A City government as innovative as the people we serve” – Mayor Kevin L. Faulconer (State of the City 2014)
Performance & Analytics Department (PandA)

City Administration Building
202 C Street, Floor 8, MS 8A
San Diego, CA 92101
panda@san diego.gov

Featured Tools

- Open Data Portal
- Performance Dashboard
- Get It Done
Performance & Innovation Teams: How They Can Help

- Simplify the Customer Experience
- Champion data-informed decision making
- Promote a culture of continuous improvement and accountability
A message from
Mayor Kevin L. Faulconer

The Strategic Plan sets the City of San Diego's direction and priorities. The mission, vision, values and goals laid out here were carefully chosen and developed to help all employees as we serve San Diego residents, visitors, businesses and neighborhoods.

As a City employee, you have the power to bring positive and lasting change to our communities. This document will ensure all of us are working with the same shared values when interacting with the public and our fellow employees.

I hope you will use this as a guide whether you are protecting our neighborhoods, repairing our infrastructure or assisting the public. In any of the numerous ways City employees are asked to serve every single day. We all play a part in the overall success of our organization.

Following this plan will help us create a more inclusive and effective City government that improves the lives of every San Diegan in all of our neighborhoods. Working together, we will provide world-class service that is worthy of our world-class city.

How

10 x 10 x 2 = 200
SAN DIEGO WORKS PROGRAM

• Promote ideas that generate savings and identify efficiencies and process improvements
• 50 information sessions/tailgate meetings w/2000+ employees
• 550 employees participated in 262 proposals
• Over 100 Proposals recommended for award
• $6.5 million in savings over 5 years
SAN DIEGO WORKS PROGRAM HIGHLIGHTS

- Modify refuse collection routes
- Modify/replace aeration equipment to save on chemicals, water, energy by installing deaeration equipment
- Shift schedules for aquatics staff to reduce OT
- Discontinue blue ink on City stationery
- Use only standard envelopes
- Waive 50% of outstanding library fees for returned materials
You can't manage what you don't measure
You Can’t Measure What You Don’t Manage
How Open Data helps

Residents / Businesses / Hackers
- Look at the City budget
- Pull in a calendar of events into my phone
- Avoid construction in my commute
- See when my street or sidewalk will be fixed

City employees
- Access data from other departments
- Be transparent
- Reduce time responding to PRA
data.sandiego.gov
The portal is a catalog of high-value City data

- **Database tables**
  - City water use
  - Water testing

- **Map files**
  - ESRI Map Gallery
  - SanGIS layers

- **Spreadsheets**
  - Tax revenue
  - Parks water use

- **Reports**
  - Budget
  - CIP

For:
- Residents
- City staff
- Businesses
- Data scientists
Personas to Determine Value

Becky the Software Dev
I want raw data access to build my projects

Robert the Community Activist
When I go to council, I want to back up my arguments with reliable data.

Jennie the Local Resident
I just want to know if my neighborhood is safe.

Office of the Mayor and Council Offices
I want to make the right decisions for my constituents that are driven by reliable data.

Karl, the Department Director
I want to know if we're meeting our success metrics and whether we're really able to have impact.

Alissa the Traffic Engineer
I want the right data at the right time to make sure I base my designs on correct information.
Criteria to Classify High-Value?

- **Value**
  - Is the data in high demand?
- **Security**
  - Would private information be released?
  - Would the City be exposed to risk?
- **Quality**
  - How is the data collected, and how accurate is it?
- **Readiness**
  - How technically feasible is it to move the data from its source system to an open format?
Publishing the inventory

Anyone can view the inventory and vote for a dataset to be prioritized for release.
Defined data release process

- Meet with data stewards
- Review data sample
- Remove PII
- Stage dataset on portal
- Get approvals
- Plan for updates/automate
Prioritizing Publication

We identified high-priority datasets for release based on the following questions:

- What’s the demand for the data?
- Is the data high quality?
- How ready is the data for publication?
  - Is it already published online, but not machine readable?
  - What are the technical limitations to release?
  - Can we automate updates?
Data release case study

How to interpret the results

A value of "A" under coliform and/or E.coli means "absence," or that the latest test at that site was negative for indicator bacteria. A value of "P" means presence.

A positive result for coliform from one single test is not enough to constitute an MCL (Maximum Contaminant Level) violation. An acute violation occurs when a site that initially tested positive is repeat tested and either the initial sample or one of the repeat samples is positive for E.coli. A monthly MCL violation occurs if more than 5 percent of all routine and repeat tests are coliform positive. A positive coliform result from a single routine test may be due to sampling error or bacteria in the testing mechanism but not in the drinking water pipes.

Public Utilities currently has 160 sample sites for the City of San Diego drinking water system and is required to test 85 sites per week. Temperature, chlorine and pH are measured on site, and then a sample is brought to a lab to test for the presence of the indicator bacteria coliform and E.coli. Coliform and the strains of E.coli tested serve as indicators of the presence of potentially harmful bacteria.

1. Met with staff
2. Worked with data samples
3. Connected the portal to the data source
4. Staged the dataset
5. Created a data story
6. Sought feedback
Each orange square represents one dataset

At launch: Portal contains data from 11 departments
Datasets people are using

For datasets, a **download** is worth more than a pageview

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</table>

**Police calls** for service in 2016

**Comm. Plan boundaries**

**Police calls** for service in 2015

Last six months of **code violation complaints**

Requests for service through **Get It Done**

Last 12 months of **Fire Dept. incidents**

Call types for **Police calls** for service

**Traffic counts**

Permits issued by **DSD**
Automation

Portal users can depend on high-quality data because of our **Extract, Transform, Load** process.

![Diagram of data processing flow]

- Data sources are processed using tools like SafeFME, R, and Python.
- ETL processes data for local storage.
- Data is then uploaded to Amazon S3 at `data.sandiego.gov`.
- This process can be performed daily, weekly, or monthly.
Resident Satisfaction Survey

Q11. Satisfaction with Parks and Recreation Services
by percentage of respondents (excluding don't knows)

- Availability of parks and recreation facilities: 24% Very Satisfied, 51% Satisfied, 17% Neutral, 6% Dissatisfied, 3% Very Dissatisfied
- Maintenance of City beaches: 19% Very Satisfied, 54% Satisfied, 19% Neutral, 7% Dissatisfied, 3% Very Dissatisfied
- Maintenance of City parks: 18% Very Satisfied, 51% Satisfied, 20% Neutral, 8% Dissatisfied, 3% Very Dissatisfied
- Hours of operation at City parks & rec facilities: 19% Very Satisfied, 49% Satisfied, 22% Neutral, 8% Dissatisfied, 3% Very Dissatisfied
- Open space and walking & biking trails: 17% Very Satisfied, 46% Satisfied, 23% Neutral, 10% Dissatisfied, 4% Very Dissatisfied
- Maintenance of City recreation facilities: 17% Very Satisfied, 44% Satisfied, 28% Neutral, 8% Dissatisfied, 3% Very Dissatisfied
- Maintenance of City swimming pools: 14% Very Satisfied, 40% Satisfied, 34% Neutral, 7% Dissatisfied, 5% Very Dissatisfied
- Quality of recreational programs & classes: 14% Very Satisfied, 37% Satisfied, 35% Neutral, 8% Dissatisfied, 6% Very Dissatisfied
- Programs offered at City swimming pools: 13% Very Satisfied, 36% Satisfied, 38% Neutral, 8% Dissatisfied, 5% Very Dissatisfied

Source: ETC Institute (City of San Diego 2015 Resident Survey)
Employee Satisfaction Survey

Q1-5. Overall Satisfaction with Job Satisfaction
by percentage of respondents (Excluding “Don’t Know”)

- I know how my work relates to my department's mission.
  - Strongly Agree: 45%
  - Agree: 43%
  - Neutral: 7%

- My work gives me a feeling of personal accomplishment.
  - Strongly Agree: 34%
  - Agree: 43%
  - Neutral: 14%
  - Disagree: 8%
  - Strongly Disagree: 6%

- I am generally satisfied in my current position.
  - Strongly Agree: 28%
  - Agree: 46%
  - Neutral: 14%
  - Disagree: 8%
  - Strongly Disagree: 6%

- I know how my work relates to the City's Strategic Plan.
  - Strongly Agree: 30%
  - Agree: 40%
  - Neutral: 21%
  - Disagree: 6%

- I would recommend the City of San Diego as a place to work.
  - Strongly Agree: 27%
  - Agree: 33%
  - Neutral: 21%
  - Disagree: 10%
  - Strongly Disagree: 10%

Source: ETC Institute (2017)
Report these types of problems through **Get It Done**
Over 585,000 Reports Since Launch
80,230 Downloads
Wow @CityofSanDiego Used the get it done app yesterday to report broken handicap sign. Repaired today!!! #nailed it

Get it done works great!

Deniz Hom
Mesa Viking/Ericson

It took less than 10 days for the City to fix the broken street light from the day I reported the issue.
Please contact the City to get it done. It really works! Here is the website: https://www.sandiego.gov/get-it-done.
Deniz
Performance & Analytics Department: Tools
Performance & Innovation Teams: How They Can Help

1. Graffiti
2. Potholes
3. Street Lights
Operational Excellence, Analytics
Types of Projects

Just Do It/6-S (Introductory Course Graduates)
- Small scope
- One to a few people involved
- Usually within one work area

Rapid Improvement Event (RIE) (Advanced Course Graduates)
- 2-5 days in length
- Focused group of participants
- Typically impact multiple work areas

OpEx Project (OpEx Project Team)
- Large scope
- Usually 3-6 months
- Impact multiple departments
Process Mapping

- Process maps are a pictorial representation of a particular process.

Useful for determining:
- The actual steps in a process
- Where problems in the process may occur
- The **value added** steps in a process (as determined by the customer)
- The **non-value added but necessary** steps in a process
- The **non-value added** steps in a process (waste that should be eliminated)
The 8 Types of Waste

- Defects
- Overproduction
- Waiting
- Non-utilized / Underutilized
- Transportation
- Inventory
- Motion
- Excessive Processing
Defects

• Errors or mistakes that causes rework in order to correct the problem
  • Mail sent to the wrong address
  • Wrong signatures
  • Not having needed parts for repair
  • Forms with missing or incorrect information
Overproduction

• Creating too much material or information

• Excessive information required

• Multiple copies

• Various interpretations of regulation requirements

• Producing reports that no one uses
• Waiting for material or information, material or information waiting to be processed

• Delays in completing information on a form

• Waiting for returned email or phone calls

• Waiting for signatures

• Full in-baskets
Non-utilized / Underutilized Talent

• Not taking full advantage of the capabilities of people or equipment
  • Using staff above or below their position and training abilities
  • Un-used equipment
Transportation

• Moving material or information
  • Moving equipment from location to location
  • Emailing forms to different departments
  • Offices located on different floor or buildings
Inventory

• Having more material or information than you need

  • Multiple versions of a form
  • End of year supply surplus
  • Any “work in progress”
• Moving people to access process material or information

• Poor Ergonomics

• Excessive bending, reaching, walking to complete a process step
Excessive Processing

- Processing more than necessary to achieve the desired output
- Repeated email or phone calls
- Redundant activities
- Excessive reviews or signatures
Metrics

T.E.A.M.

**TIME**
How long does it take to make your widget?

**ERRORS**
How many have to be re-worked?

**AMOUNT**
How many widgets do you make?

**MONEY**
Material Costs & Hourly Rates
Key Personnel Positions

Technology & Innovation Team Leader
Neighborhood revitalization, planning and development

Performance & Analytics Coordinator
Utilizing performance data for City improvements

Customer Experience Program Coordinator
Concentration on technology and innovation

Data Science Program Coordinator
Applying relevant data to policy

Chief Data Officer
Implementing the Open Data Initiative
http://bit.ly/2ITrhJ0
Lessons from Other Cities
Performance & Innovation Teams: How They Can Help

Measuring and Reporting Quarterly Performance
Scottsdale, AZ

How are we doing?
This is a snapshot of measures from the city’s Quarterly Performance Report. For more measures, go to ScottsdaleAZ.gov, search “performance.”

- **705,000** visits to the Scottsdale McDowell Sonoran Preserve
  - TARGET: 750,000

- **2.2 million** transit riders
  - TARGET: 2.4 million

- **42,926** non-local flights at Scottsdale Airport
  - TARGET: 43,500

- **274** special event days at WestWorld
  - TARGET: 270

- **67.0 million gallons** of water produced daily
  - TARGET: 67.5 million gal

- **28%** percentage of household waste that is recycled
  - TARGET: 30%

- **4.37 minutes** for average fire response time
  - TARGET: 4.39

- **4.48 minutes** for average police response time
  - TARGET: 5.11
Coordinating Emergency Responses with the help of Twitter

Chicago, IL
Experimenting with Diverse Positions and Backgrounds
Seattle, WA

Director of Innovation & Performance
Strategy analysis and formulation, Stakeholder Engagement, Pay for Success

Innovation & Performance Program Manager
Strategic Planning, Facilitation, Change Management

Data Analytics Lead
Data Science, Experimental Testing and Applied Research Techniques, Policy Analysis

Senior Data Warehouse Developer
Business Intelligence, Data Warehousing, Data Automation

Administrative Support
Team Coordination, Bureaucratic Wayfinding, Stakeholder Management

Smart City Program Coordinator (2017 only)
Implementing Smart City Programs
What We Have Learned in San Diego

- City staff will be some of the biggest users of City data – culture & data literacy matters
- Staff need guidance and space to improve processes, with or without technology
- Many potential analytics projects out there
- It is important for the community to know there is a team at City Hall making government work better
Activity
Auditors and Innovators
Understanding Smart Cities

Auditing the Smart City
Instrumentation enables cities to gather more high-quality data in a timely fashion than ever before.
**Interconnection** creates links among data, systems and people in ways not previously possible.

### Internet Usage Among U.S. Adults

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<th>Year</th>
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<td>2018</td>
<td>100%</td>
</tr>
<tr>
<td>2019</td>
<td>100%</td>
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</tbody>
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**Intelligence** enables cities to generate predictive insights for informed decision making and action.
Streetlights

Streets SD

1151 Miles

21 Avg Miles Per Month

All work from July 1, 2013 to December 31, 2017. This information is updated quarterly.

Work Type

- Overlay: 36%
- Concrete: 62%
- Slurry: 2%

Work By Month

sandiego.gov
Street Conditions 2011 vs 2015
Understanding Smart Cities: Tools

Auditing the Smart City

San Diego, CA

ACTIVE MANAGEMENT

Current Devices 14,483
Caps and Regulations
Policy Zones 3 active

PLANNING

Fleet Distribution 12,973 per day
Deployments 11,661 per day
Rider Dropoffs 24,774 per day
Trips 21,813 per day
Trip Paths

sandiego.gov
Perform San Diego

Safe and Livable Neighborhoods

Resiliency and economic prosperity

High quality public service
Dashboard

Performance overview

Keep tabs on whether the City has improved in select key areas.

City metrics

- **Fire response**: 79.1% (Last measured Q3 2016)
- **Police response**: 6.9 (Last measured 2015)
- **Crime rate**: 23.61 (Last measured 2015)
- **Crime counts**: 32,297 (Last measured 2015)
- **Crime clearance**: 20.1% (Last measured 2015)
- **Library hours**: 99,034 (Last measured 2016)
- **Rec center hours**: 135,877 (Last measured 2015)
- **Street repair**: 308 (Last measured 2016)
- **Infrastructure**: 68.2% (Last measured 2017)
- **Business help**: 5,970 (Last measured 2015)
- **Reserve policy**: 14.5% (Last measured 2016)
Budget Transparency

The budget document can be found at sandiego.gov/fm/index.shtml.
Public Records Platform

The City of SAN DIEGO

Open Public Records
This web portal will help you communicate with your government about what documents you need. All previous requests and responsive documents are viewable here online. You may even find what you're looking for without having to submit a new request! Use of the NextRequest platform is intended to facilitate public access to public records. Official records are held by City departments and the Clerk pursuant to governing document retention schedules.

Search 2379 requests and counting.

Make a new public records request.
Community Planning Tool

Select an option for subarea A, then click 'Next' to continue to the next subarea. Your results will be reflected on the aerial map and in the progress gauge at the bottom.

- **Current Plan - Community Center (0-25 du/acre)**
  - Mix of Uses: Commercial and Residential
  - Density Range: 0-25 dwelling units per acre
  - Total Number of Units with this Option: 667 units
  - View full area image

- **Option 1 - Community Commercial (0-44 du/acre)**
  - Mix of Uses: Commercial and Residential
  - Density Range: 0-44 dwelling units per acre
  - Additional Units Above Current Plan: 335 units
  - Total Number of Units with this Option: 1,002 units
  - View full area image

- **Option 2 - Community Commercial (0-54 du/acre)**
  - Mix of Uses: Commercial and Residential
  - Density Range: 0-54 dwelling units per acre
  - Additional Units Above Current Plan: 555 units
  - Total Number of Units with this Option: 1,223 units
  - View full area image

- **Option 3 - Community Commercial (0-73 du/acre)**
  - Mix of Uses: Commercial and Residential
  - Density Range: 0-73 dwelling units per acre
  - Additional Units Above Current Plan: 1,993 units
  - Total Number of Units with this Option: 1,670 units
  - View full area image

What is your progress?

- You have made changes to 4 area(s).
- You have allocated 94% of rear units near the three trolley stations.

Please note that by selecting the option associated with the current plan (100%), no additional units would be added towards meeting the housing target.
Linking the 5 Boroughs
New York City, NY

**Challenges:** High traffic of visitors and unexplored opportunities for local business navigation and promotion.

**‘Smart’ Solution:** Using a public-private partnership with leading experts in technology, advertising, connectivity, and user experience to provide a free service that facilitates all types of communication, including key emergency services.
Using Artificial Intelligence to Audit Road Conditions

United Kingdom

**Challenges:** Poor road markings, flawed road user safety, resource-taxing traditional audits.

**‘Smart’ Solution:** Using autonomous vehicles to conduct the nation’s most comprehensive audit of road markings and conditions, comprising 1.8 billion images of 10,000 miles of roads.
An App to Address Homelessness
Austin, TX

**Challenges:** Verifying the identity of a person seeking help and knowing what care that individual has previously received.

**'Smart' Solution:** Through blockchain, the City plans to consolidate the identity and vital records of each homeless person in a safe and confidential way while providing a means for service providers to access that information.
Identifying Opportunities and Challenges in Smart Audits

**Opportunities:**
- Robust Data Aggregation, Collection, and Supplementation
- Audit Optimization
- Higher Audit Quality
- Enabling Visibility, Transparency, and Information Sharing
- Remaining Nimble

**Challenges:**
- Leveraging Management and Solutions as an Auditor
- Rapidly-Evolving Technological Development
- Skills and Knowledge Gap
- Office Culture
Key Take-Aways

- Working with City staff (from both i-teams and auditors) to empower them and ask for their input is critical
- The very process of working on innovation projects has resulted in more efficiency, accountability, and transparency
- The opportunities for additional work and the overlap of auditing and innovation are endless
Activity

How Smart is Your City?
Performance & Analytics Department (est. 2014)

Performance & Innovation Teams: How They Can Help