

# LOCAL GOVERNMENT TECHNOLOGY

@ edmunds  
GovTech



# Presenters



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# TODAY'S AGENDA

Introduction & Background - **5 minutes**

Efficiency in Product Integration - **5 minutes**

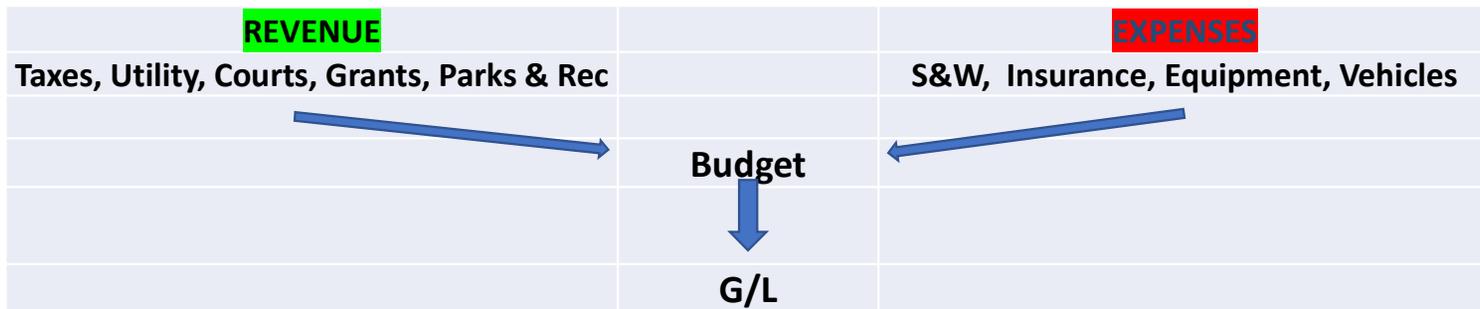
Timeline of Technology in Local Government - **10 minutes**

Four Evolving Technologies - **20 minutes**

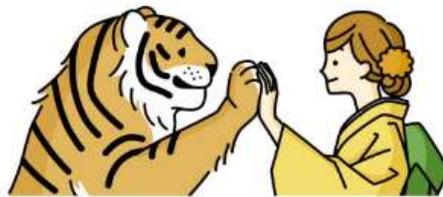
Q&A - **10 minutes**



# Efficiency thru Product Integration



*Tame the Beast! Cut Costs, Reduce Errors & Increase Efficiency*



# Timeline of Technology in Local Government



# TIMELINE OF TECHNOLOGY

1980s

1990s

2000s

2010s

2020s

- Local government began to widely adopt computer systems.
- Medium sized municipalities could afford minicomputers for tasks such as accounting, payroll, and property tax billing.
- “Mini” was relative to computers from the 1970s.
- By the end of the 80s, many small and medium municipalities had their first computer system.



IBM System 36 5360

# TIMELINE OF TECHNOLOGY

1980s

1990s

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2020s

## Personal Computers

- The biggest change in 1980s computer tech was the arrival of Personal Computers in the office.
- IBM introduced its Personal Computer in August 1981. It cost \$1,565 and weighed 28 pounds. Once a color display, a printer, and two floppy disk drives were added, it cost \$4,000 (about \$12,000 today).



IBM PC 5150

# TIMELINE OF TECHNOLOGY

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## “Killer” Applications and LANs

- The "killer" applications of spreadsheets and desktop publishing.
- As PCs became more widely adopted, Local Area Networks (LANs) became popular.
  - LANs initially allowed multiple PCs to share expensive devices.
  - As LANs progressed, they enabled users to communicate and collaborate more easily.
- The need for PCs and LANs in a municipality has not changed in the last 35 years.

# TIMELINE OF TECHNOLOGY

1980s

1990s

2000s

2010s

2020s

## The Internet

- The Internet became widely available in the 90s.
- The Internet got many more people using computers.
  - Enabled communication and information access on a global scale
  - Provided access to a vast amount of information
  - Paved the way for new types of businesses
- Local government email and messaging grew from the LAN to anywhere.
- Municipalities published their first websites.

# TIMELINE OF TECHNOLOGY

1980s

1990s

2000s

2010s

2020s

## The First Decade

- Local government began offering online services.
  - Bill payment, Permit applications, and Service requests
- Geographic Information Systems (GIS) became popular.
  - Allowed a municipality to map and analyze spatial data
- September 11<sup>th</sup> and Hurricane Katrina led to increased investment in emergency management technology.
- Local government began to adopt open data policies.

# TIMELINE OF TECHNOLOGY



## The Second Decade

- The rise of smartphones and tablets -
  - Mobile devices
  - Mobile apps
- Social media platforms such as Twitter and Facebook became more popular.
- Local government became more reliant on technology, it also became more vulnerable to cyber threats.
  - Cybersecurity measures such as firewalls, antivirus software, and VPNs became widely used.



# TIMELINE OF TECHNOLOGY

1980s

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2020s

- The Internet of Things (IoT) devices improve efficiency and service delivery.
  - Smart water meters
  - Water management
  - Traffic management
- COVID-19 accelerated the adoption of digital technologies for remote work and online service delivery.
- The advent of Artificial intelligence (AI) in the workplace.



# FOUR EVOLVING TECHNOLOGIES



# FOUR EVOLVING TECHNOLOGIES

- Four technologies continue to evolve in local government
  - Digital government
  - Automation
  - Cybersecurity
  - Cloud Computing
- Digital government is the most resident visible of the four technologies.
- Residents can see and interact with components of digital government.



# FOUR EVOLVING TECHNOLOGIES

## Digital Government – The Municipal Website

- 21 years ago, a municipal website was static, text-heavy, and contained limited information.
- New York Times from Feb 14, 2002

The screenshot shows the front page of The New York Times website as of Thursday, February 14, 2002, at 4:36 PM ET. The page features a navigation menu on the left with categories like Job Market, Real Estate, and Automobiles. The main content area includes several news articles with headlines such as 'Daschle Vows Prompt Action in Senate on Soft Money Ban', 'Milosevic Begins His Defense, Blasting NATO for '99 Bombing', and 'Bush Offers Alternate Pollution Plan'. A sidebar on the right displays market data for the Dow Jones Industrial Average and other indices, along with a 'View Your Personal Portfolio' section. The page is densely packed with text and links, characteristic of early web design.

# FOUR EVOLVING TECHNOLOGIES

## Digital Government – The Municipal Website

- Since 2002, municipal websites have evolved -
  - More visually appealing
  - Designed to streamline services and increase resident engagement
  - Commonly publish meeting agendas, meeting minutes, and budgets
- Runs well on traditional computers and smaller mobile devices
  - Should be ADA (Americans with Disabilities Act) compliant
- COVID-19 accelerated municipalities offering digital services -
  - Virtual meeting & hearings, Online payments, and Online permitting

# FOUR EVOLVING TECHNOLOGIES

## Digital Government – Automation

- Automation is intended to improve efficiency/productivity and improve the resident experience.
- Automation initiatives include –
  - Electronic permitting and licensing systems
  - Online payment systems
  - Smart Parking Meters (and Smart Utility Meters)
  - Online submission of Open Public Records Act (OPRA) requests
- Much of the efficiency/productivity comes from electronic forms that accept data and update a back-end system.

# FOUR EVOLVING TECHNOLOGIES

## Cyber Security

- Cyber Security is less visible than the municipal website.
- Critical in protecting networks and sensitive information from -
  - Ransomware
  - Malware
  - Phishing
- Cyber breaches can result in -
  - Significant financial losses
  - Reputation damage
  - Legal liability

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**"I'm no expert, but I think it's  
some kind of cyber attack!"**

# FOUR EVOLVING TECHNOLOGIES

## Cyber Security

- Some cybersecurity measures are maintained by IT, others rely on every employee
  - Phishing and Social Engineering
  - Train employees on identifying phishing emails and other cyber security hygiene
- Encrypt Sensitive Information
- Have a continuity plan if computer systems are ever breached.
  - A robust backup policy is critical.
- Securing your network can be expensive and regular upkeep is needed.
  - Moving on-premise servers/applications to the cloud will reduce the “size” of your network.
  - This can both reduce cost and improve security.

# FOUR EVOLVING TECHNOLOGIES

## A good data back up policy follows the 3-2-1 rule

- 3 copies of your data
- 2 media types
- 1 offsite (with an Air Gap)
- Disk and Cloud
  - Combining local disk and cloud storage is a common strategy
  - Remote cloud backup can protect from on-premises disaster and malware
- Backups must be tested (restore the backup)

# FOUR EVOLVING TECHNOLOGIES

## Everything you were told about passwords was wrong

- What you've been told about passwords over the years was –
  - Wrong - Change your passwords often
  - Misguided - Choose long complicated passwords
  - Counterproductive - Don't reuse passwords
- Everyone reuses passwords
  - Reusing a long and complicated password almost never matters in the real world.
  - The most common password attack uses passwords stolen in data breaches.



“For security, our signs need to be at least eight characters long.”

# FOUR EVOLVING TECHNOLOGIES

## Everything you were told about passwords was wrong

- Notebooks are a simple solution, but people are ridiculed for using them.
- Password managers are a better solution, but they are harder to use than notebooks.
- The one password tip that can transform password security:
  - Use multi-factor authentication (MFA)
- How do I know if one of my accounts has been involved in a data breach previously?
  - <https://haveibeenpwned.com> aggregates information about historical data breaches
  - [VitoP@EdmundsAssoc.com](mailto:VitoP@EdmundsAssoc.com) - 17 data breaches (Adobe, LinkedIn, MGM Resorts, Twitter)
  - [VitoP@EdmundsGovTech.com](mailto:VitoP@EdmundsGovTech.com) - 1 data breach (Drizly)

# FOUR EVOLVING TECHNOLOGIES

## Cloud Computing

- Cloud technology can improve cyber security
- Cloud providers offer the standard services (anti-virus software, firewalls), plus they have additional security services that are not possible/economical within a municipality

### Benefits of Cloud Computing:

- Automatic updates
- Reduced IT maintenance
- Disaster recovery
- Access
- Increased performance
- Consistent monthly/annual costs (easier budgeting)

# FOUR EVOLVING TECHNOLOGIES

## Artificial Intelligence (AI)

- Over the past 300 years, many inventions have transformed society.

• Steam Engine (1712)	• Radio (1895)
• Telegraph (1837)	• Airplane (1903)
• Telephone (1876)	• Television (1927)
• Electric Light Bulb (1879)	• Penicillin (1928)
• Automobile (late 19th century)	• Internet (1960s onwards)
- AI has the potential to bring similar change.
  - Transportation - Autonomous vehicles
  - Healthcare - More accurate diagnosis, drug discovery
  - Natural Language Processing - Chatbots capable of understanding/responding to human language
    - ChatGPT

# FOUR EVOLVING TECHNOLOGIES

## What is ChatGPT?

- Chatbot that uses natural language processing to create humanlike conversation
  - “Intelligence” is Machine Learning
  - Show a computer a bunch of examples of what you want and ask it to find a way to produce the same result
- Responds to questions and composes various written content -
  - Draft emails, cover letters, social media posts, resumes
  - Summarize articles
  - Solve math problems
  - Code computer programs
- Remembers earlier questions and continues the conversation in a fluid manner
- If your job involves writing, you have a new tool.

# FOUR EVOLVING TECHNOLOGIES

## How Smart (and not smart) is ChatGPT?

Ask ChatGPT specific questions and instantaneously get specific answers

Category	Exam	GPT-4	GPT-3.5
		Percentile	Percentile
Graduate Record Exam (GRE)	Verbal	99	63
SAT	Evidence-based Reading & Writing	93	87
Law	Uniform Bar Exam	90	10
SAT	Math	89	70
Law	LSAT	88	40
Advanced Placement (AP)	Biology	85	62
Advanced Placement (AP)	Physics 2	66	30
Graduate Record Exam (GRE)	Writing	54	54
Advanced Placement (AP)	Calculus	43	0
Advanced Placement (AP)	English Language	14	14
Advanced Placement (AP)	English Literature	8	8
Competitive Programming	Codeforces Rating	<5	<5

# QUESTIONS?

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