

The Digital County – Documentation of Outcomes

Summary of Use Cases

September 10th, 2018



Objective of this Document

- Over the course of the past 12 months the Digital County Symposium effort has gone from early vision to reality.
- This documents briefly recaps the journey to the events and provides a detailed summary of the outcomes of the 14 working groups
- This document will be shared with all of the participants and can be shared further. We did not include any participant names as we only received authorization to do so from a small number of individuals.
- Independently, we are discussing with various stakeholders how we can take the Outcomes to the next level and keep this effort alive. This is an ongoing and ever changing discussion which will not be addressed in this document, but we will provide periodic updates.
- For any questions regarding this document please contact Oliver Buechse at oliver@mystrategysource.com

The Digital County Journey

- **A Recap of our Journey**

- Hack-it-Bracket Event
- Symposium Series
- Artificial Intelligence Use Cases
- Internet of Things Use Cases
- Blockchain Use Cases



Why “The Digital County”

Major contributions of the County

Serving the constituents

Public safety, courts, records, parks and recreation, infrastructure, health and human services, etc.

Economic development

Land use, roads, fiber optic network and other infrastructure, regulations, planning, etc.

Sample issues related to disruptive technologies

- How can services be delivered differently while safeguarding privacy and safety?
- How can sensors, data, and intelligence be used to optimize infrastructure, energy management, public safety?
- How can new technologies assist in enhancing cybersecurity?
- What are the infrastructure needs of the new economy and how can the counties help create it?
- What policies and regulations are needed to govern and oversee the emergence of the new technologies?
- And many more...

An Opportunity to take the Lead

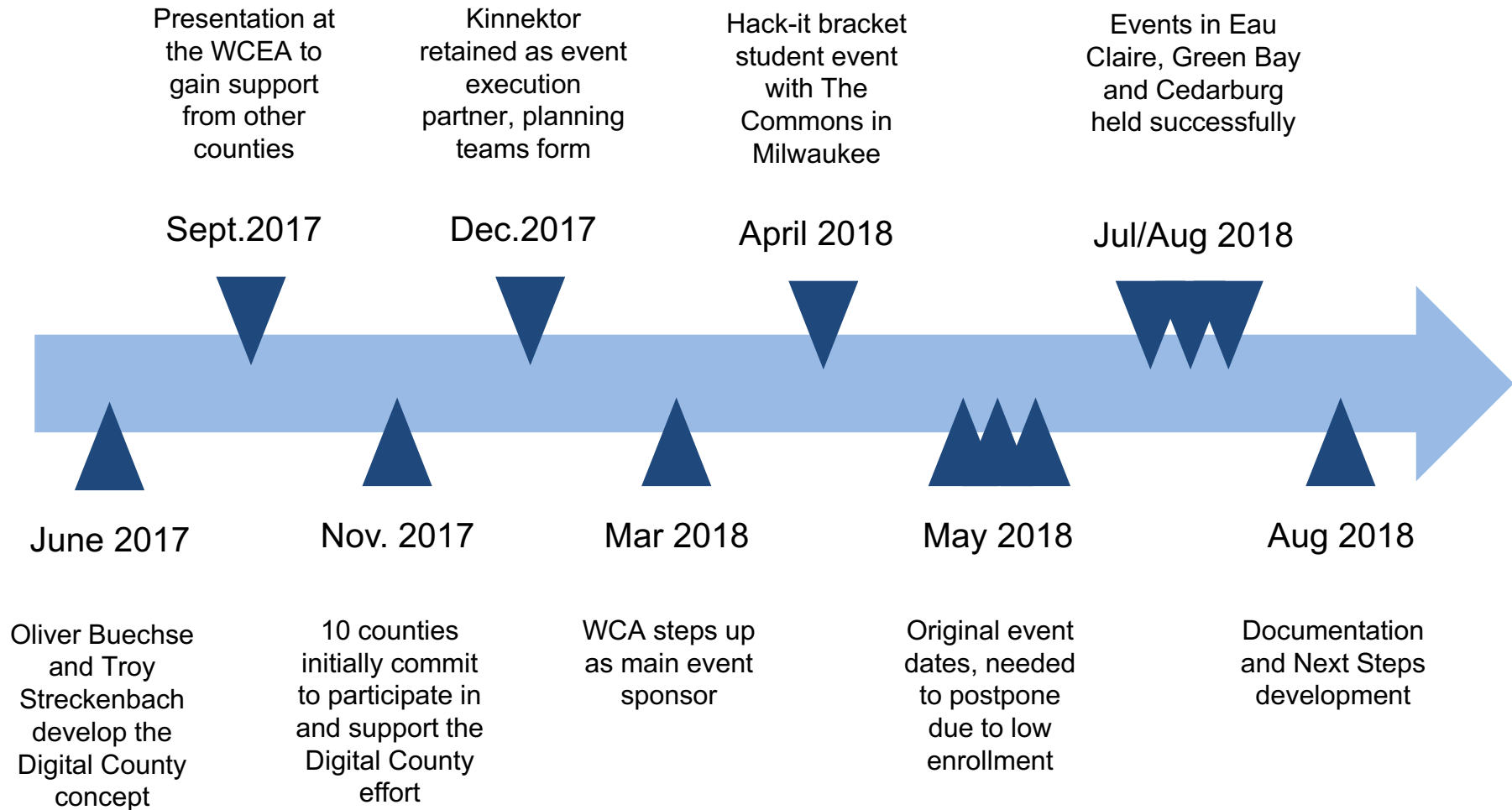
Why now?

- The technologies are emerging quickly and the time to adequately prepare is getting shorter and shorter
- Other categories like Smart Cities, Federal Policy Implications, or applications in the private sector have drawn much larger attention, the County perspective has not been extensively explored
- You can take the lead on the topic

Why WI?

- Wisconsin and the Midwest are trailing in awareness on these trends and their implications. We are at risk of becoming “subject” of the change, rather than helping “shape” it and benefit from it
- We are gaining momentum through Advancing AI Wisconsin
- We have leaders willing to step up

The Journey – A Recap



The Digital County – by the Numbers

Hack-it Bracket

- 76 Students registered, 65 attended
- 8 mentors/judges involved
- 9 teams presented their outcomes/recommendations

Symposia

- 245 participants registered, 181 attended (52 Eau Claire, 63 Green Bay, 65 Cedarburg)
- Number of Counties represented: 11 (La Crosse, Eau Claire, Brown, Fond Du Lac, Ozaukee, Sheboygan, Jefferson, Dunn, Iowa, Door, Chippewa)
- Experts and facilitators involved: 26
- Volunteer hours for planning and execution: over 1,000
- Working groups completed: 14

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Recap of the Hack-it-Bracket event

- AAIW and The Commons jointly organized a Digital County themed Hack-it-Bracket. The event was kindly sponsored by Chris Abele (personal sponsorship, not via the County)
- In this format, students learn about disruptive technologies by conducting research in small teams, developing ideas for application (scoped to be in the public space) and then pitching their ideas to a panel of judges
- The best ideas are carried over into the afternoon. Student teams are reshuffled to get fresh perspectives and they refine the pitches into final presentations.

- 76 students were registered, about 65 attended
- 8 mentors and judges with AI and Blockchain experience provided guidance and selected the winning teams

- The original idea was that the winning teams would become involved in the May events for the Digital County. Since we had to delay into July/August (summer break) we were not able to build this bridge between the two events.

Synopsis of Student Pitches – Samples (1)

Form-less

- Recognizing the high percentage of people in Milwaukee County receiving food share or other forms of assistance, the team identified the application process as a burden for both residents and the various government entities
- The team proposed an AI powered data base which helps applicants match forms (all forms are electronically stored and presented) from County, State and Federal agencies to their life situation and needs
- The filling out of the forms can be guided by an AI powered virtual assistant through a common user interface
- Agencies save cost in providing/printing forms and transferring the input into electronic formats. The online process provides a much higher degree of visibility into application challenges which can help optimize the forms. Information is more accessible across agencies through online search.

Karen, the virtual translator/interpreter

- With 16%+ of the population in Milwaukee County speaking a language other than English, translations are a significant issue in interfacing with administration. For those who are hearing impaired, sign language capabilities are a requirement.
- Karen is a virtual AI powered tool. She can translate between languages, including sign language, which she recognizes via camera and produces via the display of a mobile device. This sets her apart from other verbal only translation engines.
- The benefits of creating Karen do not only come in the form of enhanced customer service. The pioneering County could provide Karen on a licensing basis to other Counties and turn it into a profitable business.

Synopsis of Student Pitches – Samples (2)

S.A.F.E.

- SAFE or Secure Automated File Exchange provides the participant in Child Protective Services cases a secure platform to exchange and review information. Given the many stakeholders (e.g., various mandatory reporters) involved in the process sharing of information is a key concern and source of work and frustration.
- Wisconsin has a \$34 million budget for child abuse and neglect cases each year. Managing large paper files is a big part of that expense. Migrating the case management into a secure, private Blockchain environment makes information updates available in real time to all stakeholders. The record cannot be altered or tampered with. Information in the electronic format is accessible for enhanced analytics to create a better match for each case.

Lockchain

- Tracking of evidence occurs through various means today and has a significant rate of evidence being misplaced or lost.
- A Blockchain based system of recording, registering and tracking each piece of evidence would eliminate these cases, create a complete and accurate timeline of all actions taken with any piece of evidence, eliminate error related cost and time waste and maximize the judicial capacity.
- Adopting such a system would require law enforcement agencies, District Attorneys and Courts to adopt new policies and converge on a common technological platform, a key issue that is hard to overcome today.

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What Happens at a Symposium?

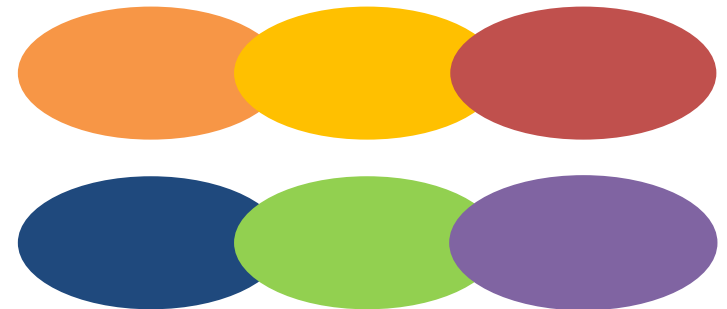
Principal Idea:

Move from knowing very little to being involved in shaping solutions very quickly

Varied selection of stakeholders (experts, local tech firms, industry reps, ED participants, State and Local Government representatives, etc.)

Morning keynote speakers: Lay a foundation for the technology understanding of the audience, describe use cases in the private and public sector

Small group workshops to explore solutions for specific county use cases



Afternoon plenary: readouts from the workshops, opportunity for Q&A, document key ideas/opportunities and next steps

The Genesis of our Use Case Topics

- Our original plan was to have the students at the Hack-it-Bracket event develop a set of use cases which could be further refined at the symposia. Given the lack of expertise among the students, we dismissed that approach.
- Instead we had a meeting with Brown County leaders Troy Streckenback, August Neverman, and Jeff Flynt. Jointly we used the following criteria
 - A meaningful portion of the County budget
 - Complex decisions involving many criteria (aimed at AI)
 - Use or potential use of sensor technology (aimed at IoT)
 - High need for security and sharing of information among various stakeholders (aimed at Blockchain)
- We initially identified about 20 potential use cases and after further feedback from the Brown County leadership team narrowed them down to 15, with five falling into each of the three symposia categories

A Three Symposium Series

Why Three?

- Opportunity to involve stakeholders across geographies
- Chance to discuss each technology trend in-depth rather than skimming the surface on all three in one meeting

Artificial Intelligence Symposium

- Host: Eau Claire County
- Venue: Chippewa Valley Technical College

7/20/18

Internet of Things and AI Symposium

- Host: Brown County
- Venue: Brown County Central Library in Green Bay

8/3/18

Blockchain and AI Symposium

- Host: Ozaukee County
- Venue: Columbia St. Mary's Center at Ozaukee County Fairgrounds (Cedarburg)

8/15/18

Digital County Keynote Highlights



Florence Hudson
Digital Disruption
and Artificial
Intelligence

- The Center for Digital Government (CDG) has been surveying County efforts for 15 years and identifies annual winners with technology best practices. Wisconsin Counties are not among the winners
- 21% of Counties in the survey have implemented AI based technologies, 36% are actively using Internet of Things solutions, and 40% are applying Drones
- While AI is machine based intelligence, it still relies on humans to develop and teach it. AI learns not only capabilities, but also biases.
- In order for us to have systems we can trust, we must build them not only valuable, but also with ethical and moral foundations, and make them transparent, have them truly work for the benefit of our citizens
- Applications of AI, Blockchain and Internet of Things are entering every sector of life, from Financial Services to Trade, from Healthcare to Government. The impact on our workforce and our lives will be very significant.

Digital County Keynote Highlights



Pedro Donati
Mastering the
Digital
Transformation
Challenge

- Emerging technology can be in various stages. We can explore those that are in early stages. We should augment our processes with those that are reliably producing value, but we should avoid creating operational dependencies on unproven technologies.
- AI uses algorithms to draw conclusions from data it already has and then applies those conclusions to data it receives. The data can be numeric, verbal, visual or a complex combination of various formats. We often discover new uses for solutions that have been developed for different purposes.
- While technology solutions often rely on infrastructure, we should not let the lack of it hold us back. We need to get into an explorer mindset and start with the problem, use design thinking to work through the pain points towards solutions.
- We can learn a lot about our problem and ideas through basic research and we can test market fit even with a small team. We will learn a lot during this phase and can use these lessons to inform the investment into our required infrastructure on the way to growth and scale.

Digital County Keynote Highlights



Adam Hecktman
Introduction to
Artificial
Intelligence

- Artificial intelligence is not a substitute for natural stupidity (quote, origin unknown). We cannot expect AI to fix our weaknesses, but it does have some capabilities that simply exceed what the human mind realistically can do (e.g. complex pattern recognition).
- So what is AI: Synthetic intelligence that makes it possible for machines to perform tasks that would normally require human intelligence. Within the field of AI many disciplines come together including Machine Learning, Perception, Knowledge and Reasoning, Planning, Natural Language Processing and Robotics.
- The assumption of a “General AI” a machine based mind that can think like a Human is not within the reach of our current capabilities. But advances in computer based vision, speech recognition, reading, and other individual tasks are already equal or superior to human capabilities.
- Machine Learning relies on mathematical algorithms of varying complexity to simulate how we learn and make decisions. It is math, and it is not even that complicated.
- AI will only be as good as the data it is fed and the time spent improving it. As accessibility to data grows exponentially and vast resources are poured into the development of AI based technologies, we can expect to see applications in almost every area of life.

Digital County Keynote Highlights



Ryan Carlson
Exploring the
Internet of Things

- Internet of Things is a trend affecting all industries to varying degrees. It's creating value that did not previously exist by combining an entire ecosystem of standalone technologies into connected solutions.
- Value is created through Monetization (e.g., the ability to rent a car per usage where it would otherwise sit idle), Optimization (e.g., telemedicine and remote care in Healthcare eliminating travel time to providers and enhancing access to quality care), Extension of Services (e.g., smart metering in energy distribution will not only measure how much is being used, but also when/how and can create variable pricing or new valuable information), and Improved Control (e.g., better machines indicating the need for maintenance, cars communicating with each other to avoid accidents)
- Through IoT sensors and devices and enormous amount of data will be generated, needs to be transmitted and stored, and can be analyzed via AI/Machine Learning. We are entering entirely new dimensions of data volume and value
- Barriers to implementation are typically not technological, but intra-organizational such as lack of sponsorship, alignment or collaboration

Digital County Keynote Highlights



Eric Franz
Emerging
Technologies and
Digital
Transformation

- By 2020 there will be 20 billion devices. While initial connectivity and analysis has been largely through the cloud, more and more intelligence is moving to the edge (intelligent devices)
- Nobody “buys the Internet of Things”, people are looking for value and it is important not to assume what people want or need, but to derive solutions from the actual needs
- Marketplace acceptance of technologies is important. While AI projects should be hypothesis driven, IoT projects should be proof of concept driven. Start small and validate that you can effectively capture data and derive the anticipated benefits, then expand.
- Innovation projects have to follow a clear methodology, otherwise innovation becomes a matter of luck. Some of the success factors are: ensure you have the appropriate engineering resources, consider creating dedicated innovation roles, and ensure you reposition opportunities through budgeting
- We will see the combination of IoT technologies, AI, and other technologies in many areas such as manufacturing, distribution and warehousing, diagnostics and training, but also more cognitive areas such as forecasting and sentiment analysis

Digital County Keynote Highlights



Florence Hudson
Blockchain and
Artificial
Intelligence

- New technologies are enabling innovations and connecting the world...creating Connected Intelligence
- Data science in a nutshell: Data is the raw material, analyzed to develop Insights. The truthfulness of the data is critical – garbage in, garbage out. Test it, and then accept it if it is true. When your expectations and the actual data-based insight are different, find out why. Watch out for bias, unconscious or conscious, in the data and algorithms creating insights. Recommendations based on Insights will be used by domain experts (e.g., Judge, Doctor, Police, Nurse, Banker, VC, ...) combining them with their Instincts based on experience and expertise, to inform Actions to enable Improved Outcomes. Insights + Instincts => Improved Outcomes
- Blockchain can be a game changer when it comes to Trust and Security. It creates a record that cannot be altered and is not owned by one party. But we have to balance the requirements of security and privacy and be alert to the possibility of collusion even in a distributed system.
- We also have to challenge ourselves to test if we truly need a blockchain solution or if traditional systems with adequate security can do the job. Who can be trusted is often the key to the issue.

Digital County Keynote Highlights

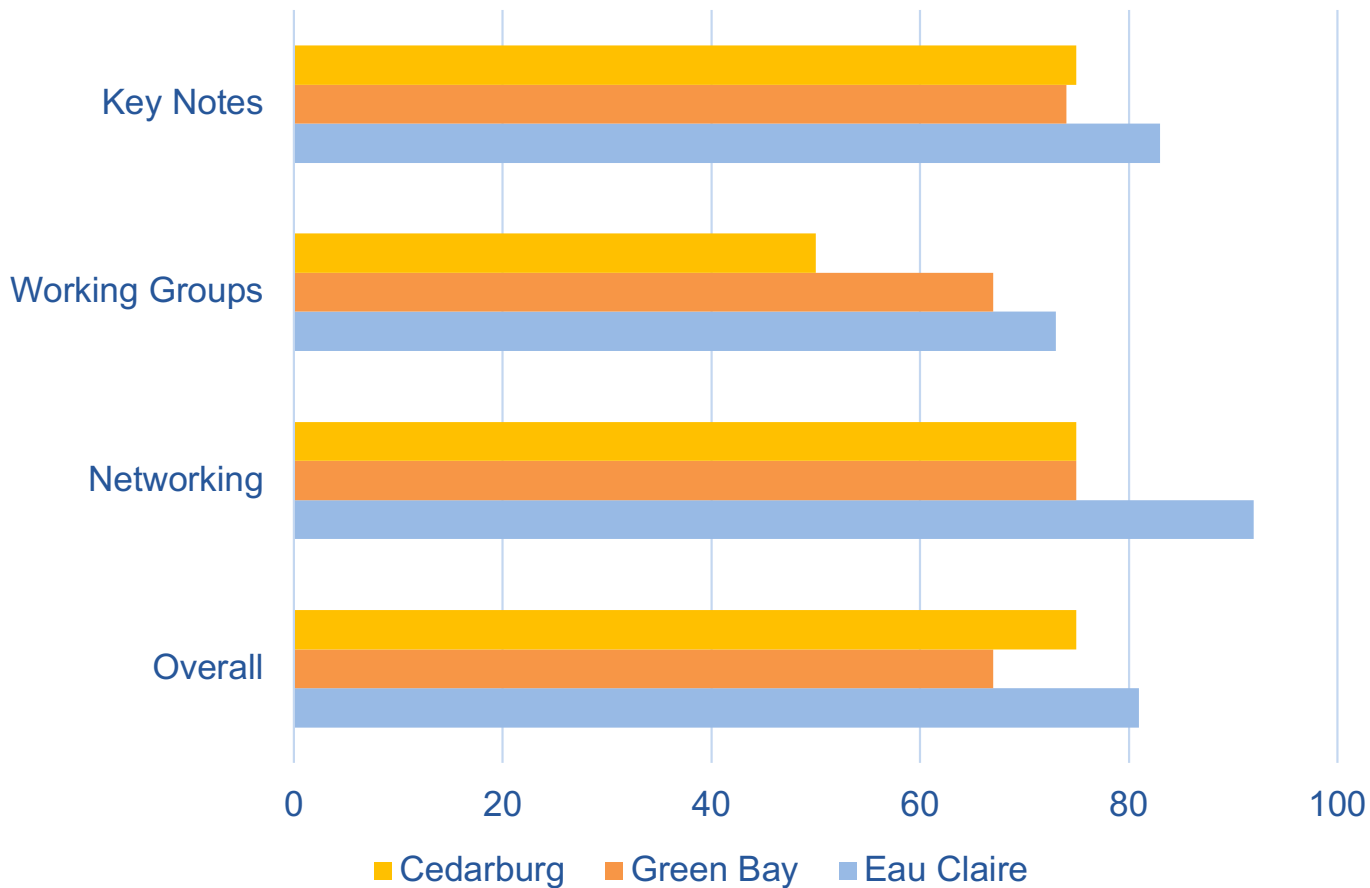


Rhommer Varilla
Blockchain – an
emerging
technology

- All technologies go through stages of Hype as described in Gartner's Hype Cycle. After enthusiasm peaks, reality sets in and initial disappointments lead into the trough of disillusionment. Blockchain and Cognitive Computing (AI) appear to be on their way there at this point.
- Those who invest too early into a technology risk losing money as it cannot demonstrate the value. Those who wait too long risk being disrupted if the technology does in fact turn out to be successful. It is too early to tell where Blockchain will be.
- Its core capabilities are: it utilizes a distributed, immutable ledger to ensure a chain of custody, it protects that immutability and provides security with advanced cryptography and algorithms, it is transparent to network members (public is all, permissioned if selective), it can help monitor stages and outcomes of transactions and create smart contracts to leverage that information, and it is creating incentives to those who provide the computing power in the form of tokens (hence the frequent misunderstanding that cryptocurrencies and blockchain are the same)
- Its main business values are to improve transparency, secure identification, reduce overhead, speed up transactions and execute payments in real time. If these are among your goals, you may want to explore blockchain based solutions.

Overall Feedback from Participants

Percentage Very high or High Value



Verbal Comments from Feedback Survey

Positives (Samples)

- The experts that were brought in to assist us were very knowledgeable as to how AI could be applied to our situation
- This was a great opportunity to learn more about opportunities within the state, specifically for county governments. While it didn't directly pertain to my organization the content does impact members we serve and thus very valuable to learn more about opportunities that exist.
- Really great blend of speakers and viewpoints, I was grateful to have the read-outs so we knew what was discussed in sessions we were not able to attend
- the overall event, in my opinion, hit it's mark in attempting to raise awareness of AI, IoT and advanced technologies in general throughout WI
- It was great to have people who are at different steps of the implementation process give info and advice on how they have done things.

Negatives (Samples)

- Better description of the agenda, format of the day, what to expect. Someone in my group said that they thought it was more of a training
- My group was stacked with people that knew little or nothing about the problem being tackled, this made things very slow, need to get the right people in each group
- I'm not sure the keynote speakers set up the topic held in the afternoon with great education. I enjoyed the breakout session however not sure there was a takeaway solution vs a pie in the sky ideas or wish list.
- I think a lot of us could have provided input on the content covered in the breakout; prior to actually attending the session.
- Consider full day sessions (or half day) to be content focused; i.e., for human services providers, for law enforcement, for economic development, etc. That would be MUCH more useful;

- brainstorming is good....not sure how we are supposed to move forward with implementation
- It will be interesting to see where this information goes as the organization matures, hopefully more counties and addition representatives buy in and contribute to the shared knowledge set that benefits our entire state.

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Artificial Intelligence Use Cases

Artificial Intelligence sessions	Facilitators
911 Optimization	Pedro Donati (Round Pegs) and Chris Carpenter (AAIW)
Jail Exit Guidance	Mark Keith (AI Innovation)
Application for Economic Support	Oliver Buechse (AAIW) and Juan Munoz (AAIW)
Child Support Case Management	Bill Tringleth (AI Innovation)
Emergency Medical Detention	Florence Hudson (IEEE) and Cameron Vetter (SafeNet)

Outcomes - Setting Realistic Expectations

- We developed an incoming hypothesis for each use case based on a discussion with Brown County leadership
- We conducted limited background research on each use case, mainly for the benefit of our facilitators to make them familiar with the topics and technology solutions that are already in the market. This research does not claim to be all encompassing and may have missed key articles or points of view.
- We analyzed the background research to point out key problems within each use case. These were once again starting points for our facilitators with no claim of completeness.
- The participants in each working group spent one hour as a team to describe/refine the problem. In some cases we identified multiple aspects of a problem, in some cases the groups decided to focus on one particular aspect.
- In the afternoon, the groups spent two hours on visioning and idea generation. It is important to recognize that we did not have professional consulting teams work on these use cases for weeks or months, but we had real world practitioners (Deputies, Social Workers, Highway Maintenance Staff, etc.) spend TWO HOURS on the issues.
- We view the outcomes as a starting point for further discussion and we are very proud of the wide range of suggestions the participants came up with in such a short amount of time.

How we are Documenting the Outcomes

Slides pertaining to each section are kept largely within this color scheme



This is usually a brief statement which captures the original thinking on the problem
(brainstormed during the identification of the 15 use cases)

References to select sources we utilized regarding the use case
A summary of key insights related to the research we reviewed

The outcome of the first hour of team discussion – framing the problem (and if applicable its components) that we are trying to solve

Documentation of the team discussion regarding possible solutions – a wide range of thoughts and formats

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911 Optimization Working Group

Initial Hypothesis

- The County is responsible for operating the 911 call center. During 911 calls there is often a high degree of emotional tension within the caller and the agent has to make potentially life critical decisions based on the information that can be collected
- How can we collect additional information and make it available to the agent (e.g. voice recognition, emotional mapping)
- How can we capture caller information more effectively
- Under which circumstances could a 911 call lead to an automated dispatch (AI assisted)
- How can we help the agents navigate the complexity of the decisions they need to make

911 Optimization – Research Sources (1)

Disclaimer: The sources listed here were collected in advance of the meeting to help facilitators prepare for the sessions. They may only reflect a small subsection of the pertinent literature on the subject and make no claim for completeness or accuracy. We are listing them here in the spirit of allowing those who want to immerse themselves deeper into the topic to have a starting point for doing so. We strongly encourage further efforts to identify additional sources and perspectives.

Topic	Author	Source/Link	Comment
Future of Emergency Communications	Judy Dunn; Police Executive Research Forum (PERF)	http://www.policeforum.org/assets/EmergencyCommunications.pdf	Great foundational article covering various technology and policy issues, introducing new capabilities including the role of AI
Overview of 911 basics and best practices	National Association of State 911 Administrators	https://www.911.gov/pdf/NASNA_911_Emergency_Management_Best_Practices_Coordination_Collaboration_2015.pdf	Foundational reading to understand the context of how a 911 center operates
Overview of 911	National Association of Counties	http://www.naco.org/resources/calling-911-funding-and-technological-challenges-county-911-call-centers	Another great introduction to the 911 environment and dynamics between different stakeholders

911 Optimization – Research Sources (2)

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Topic	Author	Source/Link	Comment
AI in future dispatch calls	Nikiah Nudell	https://www.aedrjournal.org/artificial-intelligence-for-us/	High level overview of AI application options in Emergency calls
Advanced voice analysis	Aaron Kruminis	https://www.extremetech.com/extreme/234017-authorities-using-cutting-edge-voice-recognition-to-profile-fugitives	Voice recognition software to get key info based on location and caller
Overview of various emotion recognition technologies	Nordic APIs Blog	https://nordicapis.com/20-emotion-recognition-apis-that-will-leave-you-impressed-and-concerned/	Overview of various emotion recognition technologies
Emotion recognition from voice	Affectiva company blog	http://blog.affectiva.com/introducing-affectivas-emotion-recognition-through-speech	Introduces Speech based emotion recognition capabilities

911 Optimization – Research Summary

AI could help structure the conversation based on key words picked up

- Automated Natural Language Recognition software can identify key words (e.g. shooting, not breathing) to guide the operator towards advanced protocols for the call.
- In a similar way, picking up combinations of key words could help identify risk/danger scenarios (e.g. heart attack) without that condition being explicitly referenced by the caller

AI might be the one calling 911

- The application of AI might not just be on the back-end of the 911 operations center, but could also be on the other end of the line. If Home Safety systems or virtual assistants, or other risk mitigation systems may become more savvy at identifying high risk situations, they may trigger a 911 call.
- How will the 911 environment be prepared to take calls from machines

Call analysis with complex algorithms can yield additional info, but not always in real time

- Systems exist to identify caller emotions, which may provide additional information to the operator
- A detailed analysis of the voice of callers may be used to identify prank callers or flag calls that are suspicious for other reasons

Additional Context

- Wisconsin has 109 separate 911 call centers, each with its own disparate operations, processes and procedures, and technology. The systems do not talk to one another. Many are county-wide centers in some of Wisconsin's 72 individual counties, however some municipalities or districts have elected to establish their own operations adding to the number of centers. Some counties are in densely populated areas such as Milwaukee, Madison or Green Bay and others are rural areas where cell phone and internet coverage is limited. Many 911 operations are under-staffed and have higher than desired turnover rates. Operator burnout and stress from dealing with negative and/or traumatic calls is common, contributing to the high turnover.
- The 911 system industry is going through a significant technology upgrade nationally and Wisconsin has elected to participate in this upgrade. This upgrade called NextGen 911 or 911NG includes
 1. new technology to support digital (IP) technology and receive more data formats including text, videos and
 2. an upgraded emergency services IP network (ESInet) so all 911 centers can have better connectivity and better pinpoint callers and receive more data.
- This upgrade will require significant time, effort, retraining and funding. It is still in the planning stage and it is unclear to the group if and when this will become functional and how it will change the current operational model, procedures etc.
- The group of attendees unanimously agreed that the citizens of Wisconsin would be better off with a state-level 911 system with regional centers and common technology capabilities.

911 Optimization - Problem Definition

Group focus

How can we leverage technology to create a more effective 911 process and experience for all involved stakeholders

How can we create the ability to identify and locate 911 callers using non-landline devices and protocols (Cell phones, Text messages, Instagram, Twitter, Facebook and other social media)?

How can we identify and appropriately prioritize “frequent flyers” and other “non-emergency” callers, also deal with 911 misuse, delaying action on legitimate emergencies?

How can we mitigate staffing shortages particularly during crisis events and peak caller situations, including creative solutions like providing virtual capabilities to trained off-duty or on-call staffers and diverting overflow calls to other nearby 911 centers?

What options exist to accelerate the prediction/recognition of an event requiring or likely to require emergency services (minutes matter)?

How can we solve multi-tasking needs of many 911 call takers who provide dispatch services with case details to responders while talking to callers?

How can we optimize the handling of with multiple calls for same incident and discerning/associating new or different information to the original incident report?

Additional issues: staff turnover, frustration about lack of awareness on case resolution, limited connectivity/bandwidth in rural counties

Free Format Visioning of Future State

- State-wide Emergency Data Cloud to collect, store and distribute certain data: caller & case data, computer aided dispatch (CAD), local RMS data, residential/commercial and cell subscriber data and send out public notifications.
- Utilizing caller phone info to ID and locate the subscriber and allow for better / quicker dispatch information and case registration
- Utilize AI and pattern recognition to analyze web and social media information related to caller, and potential types of activity. This could help predict certain types of incident calls, inform context information about the caller, incident or environment and inform instructions and/or additional information needed for better or more accurate response.
 - Predictive analysis based on weather conditions, anticipated or real court rulings, elections, sporting, music or other public events.
- Crowdsourcing and AI analysis of sensor data or other social media to develop heat maps of certain types of activity to provide early alert to emergency personnel. (similar to concept behind gunshot detection and triangulation systems)
 - GPS coordinated
 - Layers of info – i.e. weather, crime, previous emergencies, traffic, air traffic, etc.
 - interactive (drill down, zoom in)
- Additional caller information available (via cell data) such as important medical info
- Ability to reposition emergency cameras (fixed tower cams, police body cams, etc) and feed thru 911 systems to dispatch
- Open information sharing between agencies, including identification info like fingerprints, mugshots, social media pictures, etc.
- Supervisory system to support remote staff management and overflow handling
 - Automated time and activity tracking, reporting and interfacing into other management systems (payroll, etc.)
- Standard technology, procedures, communication capabilities to drive better response consistency

Identity and Location Info via App

Objective:

Obtain caller ID, location and other pre-registered info during 911 call from cell phones

- Minimally ID
- Other info (e.g. medical, family members) voluntary by category



Method:

Info transferred via app from phone at start of the call

Available immediately to speed up the process, shareable with first responders

- App cannot be mandated, needs to be attractive
- Possible features include...
- Other incentives: one time phone credit

County Info and Emergency App

- Could be part of a county app (or stand-alone)
- Provide updated information on events going on in the county – both social and emergency
 - Tied to GPS functionality
 - Able to ID proximate location of registered friends or family members
- Family member location features
- 911 event reporting functionality
 - Automatically send caller info upon connection to 911 request
 - First tier emergency triage (common types of emergencies)
- Other community related reporting (Falling trees, Abandoned vehicles, Potholes, etc.)
- Ability for 911 operator to take over certain phone functions (speaker, video, etc.) - Privacy concerns would need to be thought through

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Jail Exit Guidance Working Group

Initial Hypothesis

- Prior to release from jail exit interviews are conducted to collect relevant data points and identify the need for required services
- Based on the findings, information and referrals are provided to the person being released. A correct assessment and adequate information support can help reduce the chance of recidivism
- How can we support/inform the interview and data collection process, how can external data sources be effectively leveraged
- How can the decision logic for identification of required services be enhanced, how can errors and omissions be minimized
- How could capacity shortfalls for exit interviews be mitigated with higher degree of automation

Jail Exit Guidance – Research Sources

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Topic	Author	Source/Link	Comment
Release planning for successful reentry	Urban Institute, Justice Policy Center	https://www.urban.org/sites/default/files/publication/32056/411767-Release-Planning-for-Successful-Reentry.PDF	Great basic overview of what the purpose of jail exit guidance is and what some of the challenges are
Using Jail Exit Surveys To Improve Community Responses to Women Offenders	US DOJ, National Corrections Office	https://s3.amazonaws.com/static.nicic.gov/Library/020853.pdf	Outline for the rationale of having these surveys and sample survey, more great background and select case studies
AI to Assist in Risk	Bryan Lynn	https://learningenglish.voanews.com/a/ai-used-by-judges-to-rule-on-prisoners/4236134.html	Not directly related to the subject, but illustrating the use of AI in an assessment
Public Safety Risk	N/A	http://www.arnoldfoundation.org/public-safety-assessment-risk-tool-promotes-safety-equity-justice/	same

Additional Context

Notes from a conversation with a Sheriff

When a person is booked to jail, they are classified according to Northpoint classification, what type of offender are we dealing with to place them within the jail system. This information may not be used in the exit interviews (need to verify).

Exit interviews are run by Department of Health and Human Services who work in the jail. They have access to court file, but not sure if access to Northpoint.

Offender Management System may not interface well with DHS system, assume we do, but not sure.

Garbage in, garbage out – classification is based on self reported data, so how could we utilize other data.

Additional Context

Description of the current reality by the working group

- Upon entry or prior to release from jail interviews and assessments are conducted to collect relevant data points and aid in identifying the need for required services. Based on the findings, information and referrals are provided to the person being released.
- However, while some counties may conduct needs and/or risk assessments, this is not the case in many counties.
- In some counties, no interviews are conducted. In many situations, individuals are released from jail without notice, and no interviews are possible. Interviews and assessments are only possible if the release is communicated to those responsible for the data collection and assessment.
- Validated needs and risk assessments are available. They are certainly “best practices” and can provide objective and affective data.
- Tools are available to assist in decision-making based on the findings of needs and risk assessments.
- Smartphone are very common – nearly all released from jail have access to / carry a smartphone.

What problems are created because of this current reality?

Jail Exit Guidance - Problem Definition

- How can we ensure that the persons being released from jail are interviewed and have their needs assessed in order to provide information, referrals, and services specific to their individual needs?
- Where interviews and assessments are made, how can we ensure that they are adequate for predictably impacting released individuals behaviors and the risks they are taking?

How can we ensure that all released persons move through a system (processes) that allows for interviews or other data gathering activities?

How do we make the technology needed for data gathering available at the points where data can be gathered?

What must we do to ensure that new information about individuals is connected to previous information / bookings for context and to aid in sense-making?

Because that information and referrals are not enough, how can we communicate with released individuals in a way that provides feedback to foster better choices and behaviors?
NOTE: “Effective and good ‘parenting’ is needed.”

How can we ensure that information and referrals (and all types of communication) are in the individual’s “communication zone”, require the individual to interact, and that the communication follows the individual – be appropriate to the individual as their environment changes over time?

Idea Profile: Consistent Data Gathering

What is the basic idea?

- Needs and risk assessments are the foundation for all plans and actions; therefore, these data must be collected.
- Any effort must be prioritized in order to achieve the greatest impact on recidivism the quickest.
- Data gathering is consistent.

How is technology being leveraged?

- Technology must be available to gather data upon entry to, during, and on exit from jail.
- Systems / process changes may be required to ensure data is collected – upon entry, during, and upon release from jail.
- Data sources must be integrated.

What benefits are derived?

- The foundational data will be gathered including motivational and communication related data

What's next?

- This issue is not a matter of “inventing” new technology, but first and foremost of applying what already exists
- Certain technologies could aid in collecting relevant information (e.g. extraction from court files) to reduce the burden on the case worker

*Starting point only,
needs further work*

Idea Profile: Consistent Decision Making

What is the basic idea?

- Human interpretation of information about individuals to be released is consistent in terms of high quality, speed, and cost effectiveness.

How is technology being leveraged?

- AI-based decision support technologies will be employed to raise the quality of conclusions and recommendations drawn from data, interviews, and assessments and increase the speed and cost effectiveness of assessors' work.

What benefits are derived?

- Needs and risks assessments will be completed and analyzed delivering consistent high quality information and referrals to individuals released from jail and impact the ongoing communication with the individual

What's next?

- This is a step up over currently available solutions
- Expert systems can be created with relatively moderate effort on a pilot basis. Larger AI/Machine Learning solutions require a comprehensive data set to be trained (may be further out)
- This is an area for a State/County pilot

*Starting point only,
needs further work*

Idea Profile: Comparative Analytics

What is the basic idea?

- The primary process is focused on one individual being released. Over time, extensive information is being collected which should be analyzed to identify patterns

How is technology being leveraged?

- Data analytics must be transparent and based on local data. Can analyze explanatory / contextual data that is gathered in interviews and assessments
- Learns from the outcomes of interventions and adapts to rapid environmental / individuals changes of those released from jail.

What benefits are derived?

- Human decision makers receive additional information and insights regarding individuals to be released from jail.
- Analytics will prioritize the work to achieve the greatest impact the quickest.
- Output aids in focusing interventions

What's next?

- This solution is more in line with an AI/Machine learning environment
- Critical mass of local data would suggest exploration in larger jail systems and may limit applicability across all systems
- Entirely contingent on consistent data collection (see first problem)

*Starting point only,
needs further work*

Idea Profile: Communication

What is the basic idea?

- The communication with individuals released from jail will be smartphone-based, motivational, positively reinforce behaviors, proactively intervene to influence negative behaviors, keep officials / officers informed about the individual, and gather real-time data for analysis to better assist ongoing support and communications

How is technology being leveraged?

- Deliver motivation content (see detail next page)
- Monitor a broad range of individual's behaviors / actions through the smartphone for data, analysis, and rapid response.
- Provide real-time feedback to officials / officers and into the data analytics system.

What benefits are derived?

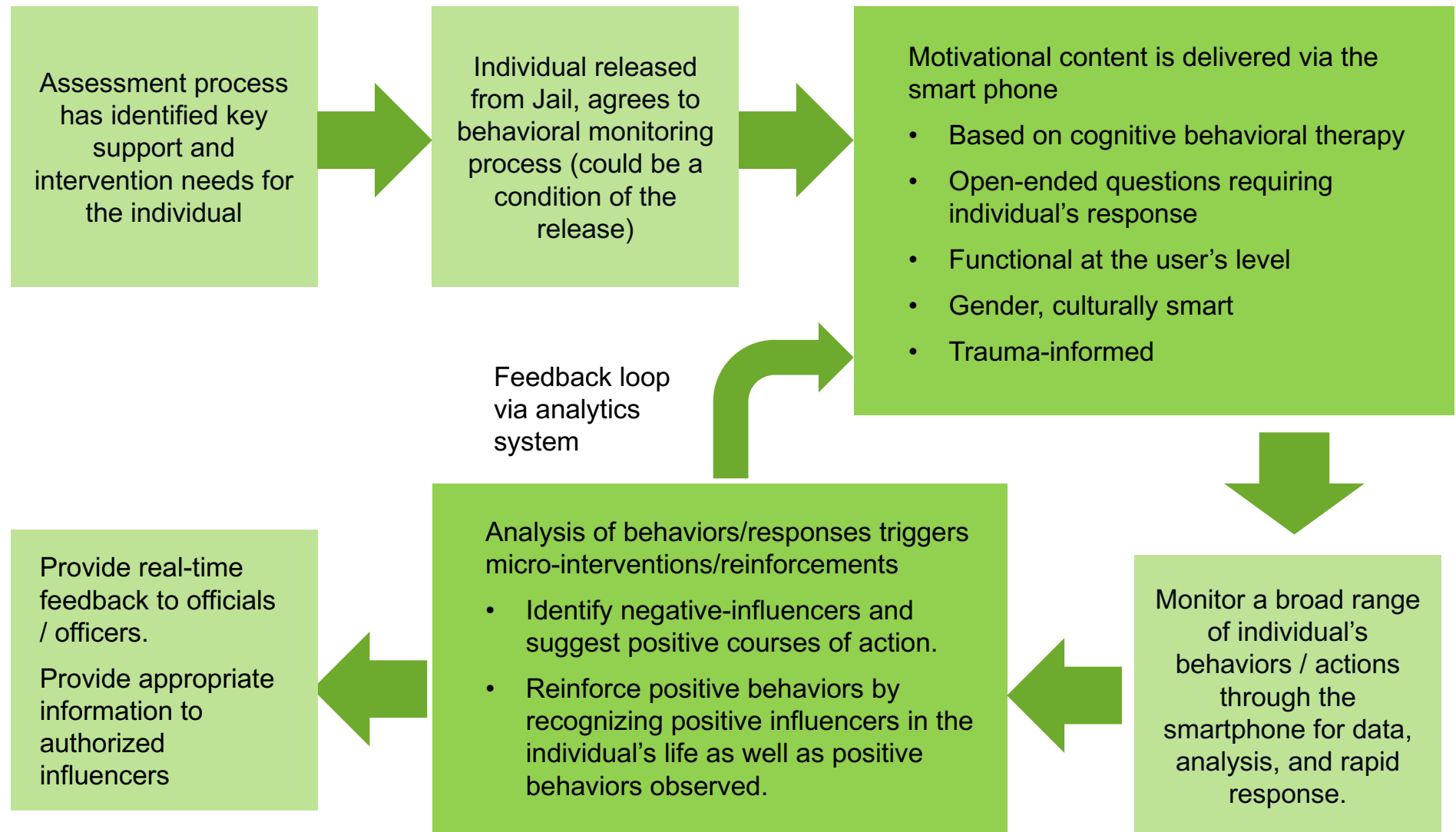
- Communication with the released individuals will be interactive and foster better choices and behaviors.

What's next?

- There are two aspects to this idea: a smart phone based communication system and a behavioral science based reinforcement program (the working group was very creative on this front)
- They can be approached individually

***Starting point only,
needs further work***

A Behavioral Science Model of Reinforcement



Implementation Considerations

Concerns and potential obstacles

- Funding – Are there opportunities to access / collaborate with state and national level initiatives?
- Access to local, state, and national data is a prerequisite.
- Regulatory and other legal requirements limit access to and the sharing of data and the output of the analytics.
- Technologies for data gathering, systems integration, decision support, and data analytics is required.
- Limited or no capacity in the jails to perform the data gathering and decisions regarding each individual.
- Regulatory and other requirements place limits on the scope of the communication.
- Moral and ethical issues regarding the limits of use may surface or will need to be surfaced.
- Bias in the data and in the output of the analytics must be monitored.

Possible first steps

In a county that currently uses interviews and/or assessments to provide information and referrals to individuals released from jail:

- Conduct a Proof of Viability in Decision Support to Provide Consistent, High Quality Human Decision Making

In a county that currently uses a system for data gathering:

- Conduct a Proof of Viability in Data Analytics and Machine Learning

The Digital County Journey

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- Blockchain Use Cases



Economic Support Working Group

Initial Hypothesis

Economic support programs (Caretaker Supplement, Child Care Assistance, Energy Assistance, FoodShare, Health Care, Fraud Investigation Services) are designed to assist people in meeting basic living and health care needs.

Each program may have income and asset limits which can vary with family size. There are also non-financial elements which need to be verified at the time of application.

- How can the application process be streamlined
- How can decision support be provided based on the large number of criteria and combinations

Economic Support – Research Sources

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Topic	Author	Source/Link	Comment
Streamlining and Coordinating Benefit Programs' Application Procedures	Sharon Parrott, Donna Cohen Ross, and Liz Schott	https://www.cbpp.org/archive/Site/6-22-05prosim.pdf	2005 paper that describes the basic process and raises some ideas for enhancements, not focused on modern technologies
AI augmented human services	Deloitte	https://www2.deloitte.com/insights/us/en/industry/public-sector/artificial-intelligence-technologies-human-services-programs.html	Vision paper exploring the possibilities of AI in human services, many additional sources in the end notes
Denmark will use AI to determine welfare payments	Gov Insider	https://govinsider.asia/innovation/exclusive-denmark-plans-to-use-ai-for-welfare-payments/	Very brief vision paper that illustrates an intent more than a reality

Economic Support – Research Summary

Multiple AI applications along the economic support process

- Opportunities on the front end application process (broadening channel access for applications, chatbots to help navigate the application process, language/translation assistance for non native speakers, auto-fill)
- Application screening and high risk assessment, verification of applications, automated outreach
- Assigning/matching case workers with cases
- Enhanced speed and service delivery, improved fraud detection

Mitigating case worker overload could be a key motivator

- Case workers are burdened with large case loads combined with high administrative effort for each case; this results in a challenging work environment, burn out and turn over. If technology could help reduce this burden, the entire dynamic around managing the economic support need could be altered
- Keys could be virtual assistants, automation of follow up, electronification of the process (not all of these are AI based)

Applying these new technologies may face “current technology” horizon challenges

- Economic support case management systems and customer care infrastructure may be outdated (e.g. old software, lack of multi channel capabilities or integration, lack of modern call/customer service technology)
- Evaluating new technologies should consider if/how they are contingent on an initial upgrade to these technologies or can help leapfrog what would be considered a traditional technology upgrade

Economic Support Problem Definition

How can we leverage digital technologies to enhance

- Needs awareness (across multiple programs/services)
- Ease of navigation through requests for assistance (in a multi-channel environment)
- Information collection and validation
- Access to external data sources
- Exchange of data between stakeholders (ideally in real time)
- Identification of patterns, risk factors or other indicators
- Communication with the applicants/recipients throughout the process
- While ensuring high program integrity

How can we enhance needs awareness and the ability to access and navigate educational resources (recognizing various barriers) to guide potential recipients to an appropriate understanding of their needs

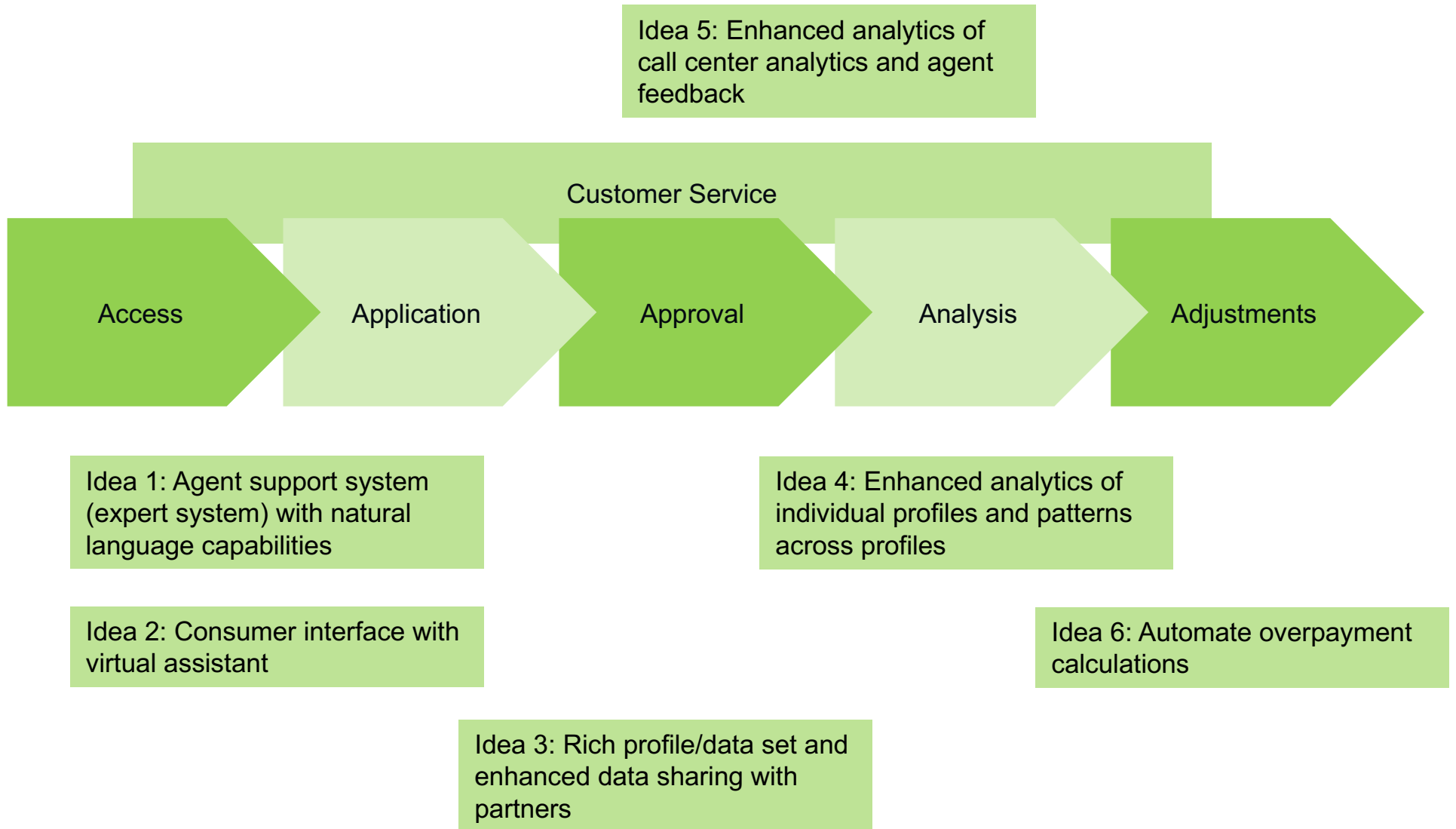
How can we simplify the collection of required information (across programs, channels) from various sources (including direct collection). How can we create an interactive loop between data collection and needs identification throughout the process

How can we enhance the accessible data universe to inform validation/verification, eligibility decisioning in a timely and accurate manner. How can we effectively and securely share information with partners in this data universe

How can we utilize the various data sources, case history, and current information (including changes) to identify patterns, trigger communications (ideally automated), set flags, and initiate and inform risk and fraud assessments.

How can we guide the customer through this process across multiple channels and ensure easy access to their information profile, application/eligibility status, and additional opportunities.

Economic Support – Reimagining Highlights



***Starting point only,
needs further work***

Idea Profile: Agent Support System

What is the basic idea?

- Agents will have the opportunity to access a knowledge system in natural language to receive guidance, reduce ambiguity

How is technology being leveraged?

- Create a knowledge/expert system with Natural Language capabilities
- Virtual assistant interface for agents
- AI based mapping of areas of ambiguity

What benefits are derived?

- Enhanced ability of the agent to assist the customer, make accurate decisions/assessments
- Fewer cases go to committee, fewer workarounds
- Heatmap of policy change needs

Starting point only, needs further work

What's next?

- Principal technology components exist, but have not been combined for this purpose
- Explore if pilots are underway (exact or analogous applications)
- Work with state agencies to test their receptiveness for technology upgrades (multiple agencies involved with varying technology status quo)
- Identify appropriate test scope (what, who, where)

Idea Profile: Customer Interface

What is the basic idea?

- Consumers are guided through the application process to assist in needs education/ identification, reduce the amount of input required
- A summary needs/opportunity profile will be generated for the consumer

How is technology being leveraged?

- Secure identification at front end
- Efficient input (e.g. picture/autofill), optical character recognition
- Real time access to internal/external data bases to retrieve suggested data (tax, credit, employment) – (see rich profile idea)
- Guided input by AI/Virtual assistant with multi-language capability

What benefits are derived?

- Improved customer experience and better match of needs with programs
- Less work for agents

***Starting point only,
needs further work***

What's next?

- Strong connectivity with Idea 1, but additional capabilities (e.g. security, data intake and data connections)
- Could be tested in components vs. entire package to reduce complexity
- Customer service standards/expectations should evolve in sync across various County programs

Idea Profile: Rich Profile/Data Set

What is the basic idea?

- A rich data set with rich individual profiles will be created to have stronger validation/verification without creating deterrents/barriers
- Enhanced data sharing with partners will be facilitated, potentially controlled by the individual

How is technology being leveraged?

- Add additional data sets to current data exchange (Counties already connect to some)
- Create rich/secure individual profile (potentially owned as a County ID profile by the consumer) - (see secure information profile use case for more detail)

What benefits are derived?

- Better visibility into drivers of eligibility (e.g. incarceration/release)
- Creation of a rich data repository to enable future consumer interactions and drive pattern recognition

Starting point only, needs further work

What's next?

- The additional data elements are on a near term horizon, but the rich ID/information profile is based on evolving technology (see self sovereign identity), hence it may make sense to decouple both
- Important to think of the customer profile beyond a single service/agency/ point of contact, so this should become a cross department conversation

Idea Profile: Profile/Pattern Analytics

What is the basic idea?

- Enhanced analysis of individual profiles and patterns across profiles (e.g. what factors lead to what decisions, what incremental needs are identified, what trends are we seeing, what is the likelihood of fraud, etc.)
- Use indicators to trigger notices

How is technology being leveraged?

- Creation of a rich data environment (see prior page) – connecting outside data will allow for stronger segmentation/pattern analysis
- Automate additional notices, fraud indicators
- Performance feedback (how well are our programs performing over time)

What benefits are derived?

- See previous idea 3 for some benefits
- Better screening of risk indicators and fraud investigations
- Match case profiles with case worker profiles

*Starting point only,
needs further work*

What's next?

- Analysis is most powerful against a richer data set, so there is a contingency to the prior idea
- AI capabilities absolutely exist to test – where can we identify a strong data set to demonstrate the capability
- We need to decide if balance of benefits is primarily for the applicants or for the counties, this can be tilted either way quickly

Idea Profile: Call Center Analytics/Feedback

What is the basic idea?

- Enhanced analysis of call center interactions to inform agent conversations, provide real time feedback, enhance KPI conversation

How is technology being leveraged?

- Recording, transcription, analysis of all calls, keyword search, voice analysis to find indicators/flags
- Real time feedback to agents and supervisors

What benefits are derived?

- Guide the conversation with the customer (not a benefit unless real time)
- Enhanced agent training and performance monitoring
- Inform State performance review

What's next?

- Again, there are layers of technologies referenced here; making the feedback real time requires stronger solutions and natural language tools than delayed
- Similar ideas did come up in the 911 use case (e.g. keyword analytics), other call center areas exist in the County – could be another cross department initiative
- Can positively connect with the knowledge system (idea 1)

***Starting point only,
needs further work***

Idea Profile: Automate Overpayment Calcs

What is the basic idea?

- Automate overpayment calculations which result from fraud investigation outcomes

How is technology being leveraged?

- Leverage knowledge repository (policy, reporting requirements and changes) and rich data set
- Pull in external data as needed
- Robotic process automation across systems (applies to highly manual and repetitive tasks involving potentially multiple systems)

What benefits are derived?

- Augment highly manual process today to free up capacity and reduce overload, more capacity available to work on cases
- Cost reduction and higher/faster capture of repayments

What's next?

- Connections to other efforts are referenced in technology section, there are contingencies (probably lot a first wave effort)

***Starting point only,
needs further work***

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Child Support Case Mgmt Working Group

Initial Hypothesis

- When the entitlement to receive child support has been established, the County may assist in the enforcement of the collection from the payor
- Case management may involve a lot of data entry, long histories of individual cases, a lot of documentation
- Brown County has run a state-wide pilot on lean processes applied this service
- How can we further enhance access and searchability of information?
- How can we optimize the retrieval of relevant information from external sources?

Child Support Case Mgmt – Research Sources

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Topic	Author	Source/Link	Comment
Basic overview of Child Support services	Wisconsin Department of Children and Families	https://dcf.wisconsin.gov/cs/overview	Website with key information to understand the use case
Future of child support	Deloitte	https://www2.deloitte.com/insights/us/en/industry/public-sector/modernizing-federal-child-support-program.html	Vision paper including technology applications
Technology trends and the improvement of Child support	ERICSA training conference	https://ericsa.org/sites/default/files/2015ConfHandouts/D4%20Presentation_PP_Tech%2BTrends%2B4%2B1%2B2015.pdf	Broad overview of technology trends and how they may apply to Child Support
Improving the Customer Care aspect of Child Support	Conduent company case study	https://insights.conduent.com/insights-for-government-agencies/how-child-support-programs-improve-customer-care	Illustrates La Crosse County and Milwaukee County's efforts of using better customer care center tech for Child support functions (may be helpful context)
Idaho rebuilding its Child Support Case Mgmt system	Deloitte case study in WSJ CIO Magazine	https://deloitte.wsj.com/cio/2018/05/16/idaho-breathes-new-life-into-child-support-services-systems/	Another use case illustrating traditional technology upgrades (may be helpful context)

Child Support Case Mgmt – Research Summary

AI or expert systems could be leveraged on the front end

- The decision to award case management and which services to provide can be complex and AI or expert systems drawing on historical data and mapping the application information to historical cases could be beneficial
- AI support could also play a role in matching the case with the case worker based on best fit criteria

Enhanced data capabilities could help fulfill some of the case management tasks

- Using new data sources (e.g. social networks), leveraging sensor technology to locate or track parents
- Customization of tactics by case: Predictive analytics and case segmentation allow to match outreach and communication tactics/sequences with the specific circumstances and predicted behavior

Applying these new technologies may face “current technology” horizon challenges

- Child support case management systems and customer care infrastructure may be outdated (e.g. old software, lack of multi channel capabilities or integration, lack of modern call/customer service technology)
- Evaluating new technologies should consider if/how they are contingent on an initial upgrade to these technologies or can help leapfrog what would be considered a traditional technology upgrade

Child Support Case Mgmt - Problem Definition

How can we leverage digital technology to improve the overall CS case management support activities

targeted to payors under an enforcement order from the court

and address the significant issues and challenges present in the current state of the CS data management and delivery system related to Payor information and services

to achieve better outcomes for all stakeholders.

What can we reduce or eliminate the Decision Quality issues that exist today and retain knowledge of experienced, soon retiring administrators?

How can we empower case administrators through technology in their core payor interactions (e.g. locating, behavior modifications)

How can we improve payor compliance with enforcement orders and optimize communication with payors in support of their willingness and ability to pay?

How can we simplify access to multiple agency data bases along the case management process for administrators?

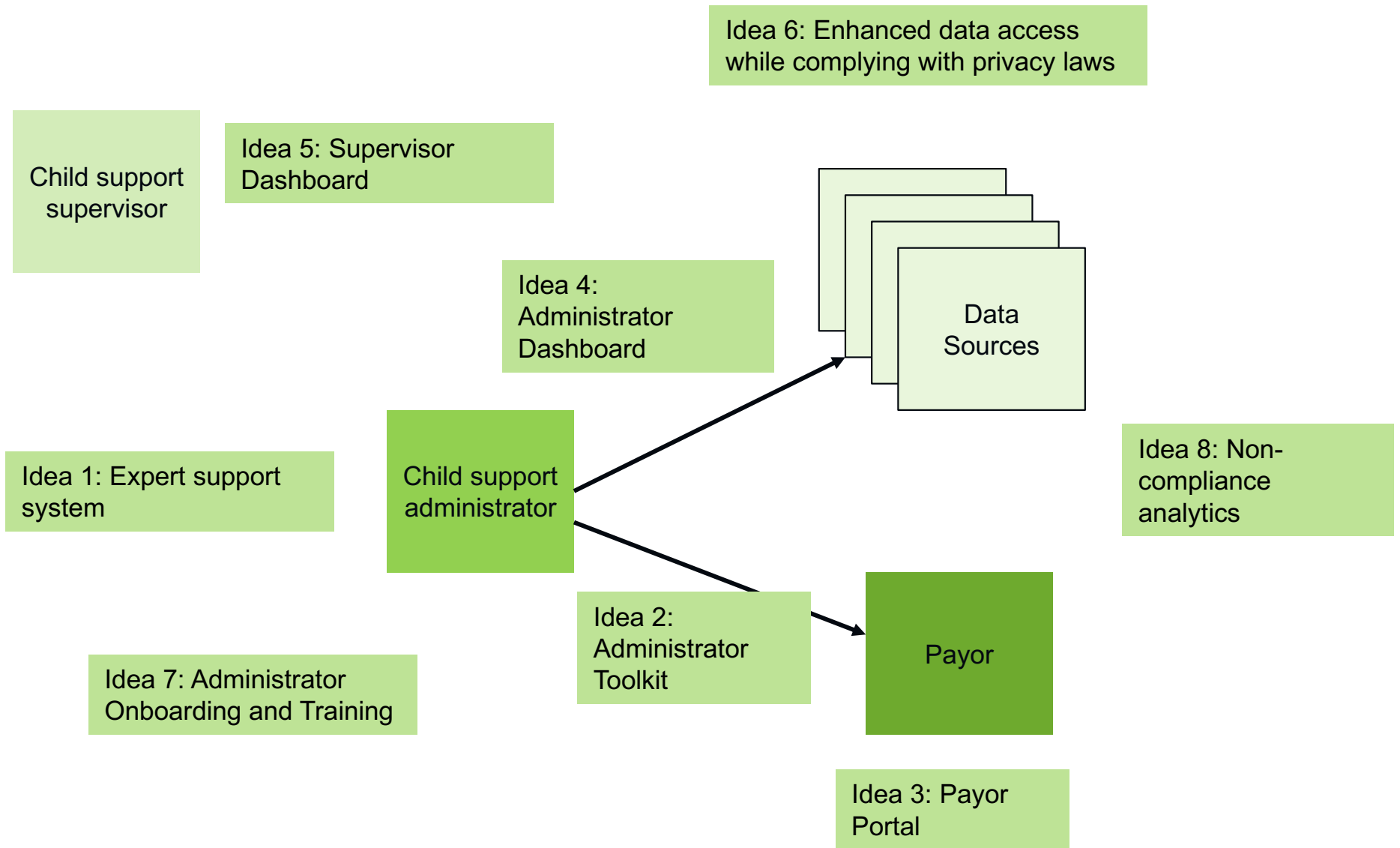
How can we balance case load and optimize fit between case characteristics and administrator skill set?

How can we gain benefits from accessing and analyzing comprehensive data sets while complying with all applicable privacy laws?

How can we optimize training and onboarding of case administrators?

How can we better identify, justify and communicate incidents of likely non compliance with court ordered child support?

Overview of Ideas



Idea 1 Profile: Expert Support System

What is the basic idea?

- The decision quality gap is defined as some CS Administrators achieving better outcomes more frequently than the rest. Root causes include tenure in the position, general life experience, training, the type of cases dealt with, accumulated wisdom and intuition.
- Further 40%+ of the CS Administrator work force is within 4 years of retirement eligibility with the potential for losing significant institutional expertise
- We want to leverage an expert system which can help prevent decision inequality and preserve institutional knowledge

How is technology being leveraged?

- New technology that digitizes expertise against specific decisions by cloning an expert's decisioning process has been introduced to the market
- Current decisions engine technology can be informed by AI examining current data sets and future inter-agency integrated data sets to identify here-to-fore non-obvious patterns that indicate action needed or predict outcomes.

What benefits are derived?

- Immediate improvement in overall decisioning across many different decisions
- Retention of expert knowledge and enhanced ability to share that knowledge within the County (e.g., new case workers) or across Counties (e.g., relevant for cases that occur with lower frequency)

***Starting point only,
needs further work***

Idea 2 Profile: Administrator Tool Kit

What is the basic idea?

- Payors who are principally unwilling to pay require extensive effort to locate, reinforce the required behavior, and introduce appropriate support services
- Payors who are willing but not capable to make payments cause similar effort, but the range of interventions is different including a focus on ease of access to information and payment options
- Enforcement of payments essentially mandates and requires a range of skills from detective to admin and therapist, but it does not equip the case workers with tools.
- By creating more effective locating, behavior modification, and support options we can dramatically reduce the administrative burden on case workers

How is technology being leveraged?

- Locating technologies: Location sensors, Smart city sensors, AI Video facial recognition, social media monitoring,
- Behavior modification: Behavioral Analysis and motivational fit technology, Smart solutions decision engines based on AI for predictive analysis, automated coaching systems,
- Communication and support: Customized Payor portals providing alerts, action steps, reporting of completion of activities, gamification of the interactions (see separate idea)

What benefits are derived?

- Improve payor compliance, in turn resulting in fewer inquiries and follow-ups
- Eliminate many current activities and enhance quality of payor interactions with the administrators

Starting point only, needs further work

Idea 3 Profile: Payor Portal

What is the basic idea?

- As described in prior sections payors may not be willing or able to pay. In both cases there may be a spectrum of willingness and ability. While we will not be able to get the payors on the far end of the spectrum to comply easily, we can provide those on near end with better support mechanisms.
- We can make it easier for Payors to have access to their past and current activity (including past due), remind them of required actions (notifications, alerts), develop payment plans and schedules, etc. By creating an online/mobile portal with access to the information and payor tools, we reduce the amount of in person interventions required by the administrators (who can then focus on the far end spectrum cases)

How is technology being leveraged?

- Multi channel (Online/mobile/kiosk) portal for payors with access to account information, messaging platform, calendaring and alert function
- Behavior modification: Automated coaching systems, incentives, gamification delivered through the portal/messaging platform
- Intuitive design (app style) with training demo to minimize onboarding risk

What benefits are derived?

- Improve payor compliance, in turn resulting in fewer inquiries and follow-ups
- Eliminate many current activities and enhance quality of payor interactions with the administrators

Starting point only, needs further work

Idea 4 Profile: Administrator Dashboard

What is the basic idea?

Databases are located at county, state or federal level, data access may require permissions, multiple sign-ins, some with view only permission. Data exists in different formats.

Future state: single sign-on into platform with connectivity to all relevant databases presented in a desktop view that matches the case management activities, with a dashboard that presents a summary status of the Case Administrator's portfolio of cases, with drill down capabilities to see the detail at the case level.

How is technology being leveraged?

- Desktop application design, combined with a data integrator and middleware that takes advantage of API connectors , OCR PDF extraction capabilities, Decisions engines, screen scraping, social media monitoring technology, and AI predictive models that generate recommendations for action steps with an overlay of calendaring and project management capabilities.
- Connections to outcome reporting systems will provide feedback loops to AT deep learning technology to identify new insights and best practices at the case scenario level to improve the "recommendations functionality of the Case Management desktop

What benefits are derived?

- Focus time on activities that result in improved CS Departmental KPIs and case
- Reduction of search and ministerial duties creates time to provide intervention activities earlier in the case management process which will lead to more cases with better outcome.

*Starting point only,
needs further work*

Idea 5 Profile: Supervisor Dashboard

What is the basic idea?

Building onto the idea of the Administrator Dashboard, the supervisor has an aggregated view with similar drilling capabilities

Additionally supervisors and managers can see case load across their teams in real time and adjust as needed, assign new cases

Case analytics suggest which cases are best suited for which case administrator. Enhanced and automated reporting capabilities.

How is technology being leveraged?

- Same as Administrator Dashboard, this is merely a different view
- AI based analytics of historical case performance and outcomes establish backdrop for ongoing evaluation of new/current cases to inform assignment decisions
- User friendly query system allows preparation of regulatory and agency reports, see in real-time the status of KPIs, case activity status and specific case actions.
- Standard report production can be automated and scheduled to both produce the reports and to distribute the reports.
- Court Case documentation and reporting of current and previous activities and results, can be produced in a simple predefined series of templates and generated in either PDF or word document, or the system can be displayed in a court room in real-time

What benefits are derived?

- Improved case balance and match with skills across administrators
- Ease of supervision for training, feedback, compliance monitoring
- Simplified reporting

*Starting point only,
needs further work*

Idea 6 Profile: Data Access and Privacy

What is the basic idea?

- HIPPA and other (official and unspoken) privacy protection rules and processes create restriction in terms of access to data. Those rules may differentiate what data may be “shared and seen” by individuals vs. “utilized for analytical purposes” without being identifiable.
- If data can be analyzed to derive certain insights and if these insights can provide a proxy to inform a decision, we may be able to build a bridge between access and compliance.
- We have to build these rules into a system to qualify the data or risk inadvertent compliance violations. The administrators have to be free to use what they can see in their dashboard (see prior section)

How is technology being leveraged?

- Rules based decision engines identify which data is subject to restrictions (“at risk”), apply appropriate redaction (data masking) and release the balance of the data for appropriate use.
- “At risk data” may still be used to inform analytic processes via algorithms without disclosure of the actual data to humans. Via this process suggestions can be developed for intervention or reinforcement actions.

What benefits are derived?

- Improved data availability at reduced compliance risk, time savings through avoidance of data search, input and validation, request for permission to access, etc.
- Broadest possible data set is available for trend analysis and predictive modeling

*Starting point only,
needs further work*

Idea 7 Profile: Enhanced Training/Onboarding

What is the basic idea?

- Training of CS Administrators can be optimized (especially if a significant retraining effort were to be required after implementation of previously discussed ideas)

How is technology being leveraged?

- Virtual reality technology can be leveraged to create specific navigation and use training for the future Dashboard and case management system. This technology makes on-the-job-training–just–in–time a possibility
- Screen sharing technology can allow system experts and trainers to “see” what the user sees in real-time, to provide, troubleshoot or to respond to feedback

What benefits are derived?

- Live classroom training can be eliminated, along with the associated expense of travel and lodging
- AI assisted learning lessons can monitor and analyze where new users are having difficulty and create extra practice activities or deeper explanations related to the activity being trained, to speed time to productivity for newly hired Case Administrators

*Starting point only,
needs further work*

Idea 8 Profile: Non Compliance Analytics

What is the basic idea?

- Currently there is no way to establish legitimacy for not attempting to resolve specific payor delinquencies. If we can identify the variables which indicate little or no chance for any type of successful outcome, we can abandon working with the payor, inform the judge who issued the court order, and redirect the recipient child and guardian towards alternative options in securing income.

How is technology being leveraged?

- AI and its predictive modeling capability can be used to calculate current use and predict future use of CS payor enforcement activities and expected success rates
- Where less than some pre-assigned percentage rate of probability for collection is predicted by AI, Case Administrators can supply that information to the recipient family, and the court, to demonstrate the decision to not provide support in court ordered child support.

What benefits are derived?

- Time, effort and resources need not be applied to that case, thus creating more time for cases with higher confidence scores for probable positive outcomes.
- AI case analysis and the generation of scores that indicate negative probable results, means human bias is eliminated, and it increases the acceptance of a decision not to pursue certain cases because the decision is based on facts and probabilities

*Starting point only,
needs further work*

The Digital County Journey

- A Recap of our Journey
- Artificial Intelligence Use Cases
 - 911 Optimization
 - Jail Exit Guidance
 - Application for Economic Support
 - Child Support Case Management
 - **Emergency Medical Detentions**
- Internet of Things Use Cases
- Blockchain Use Cases



Emergency Medical Detention Working Group

Initial Hypothesis

In a mental health crisis situation an individual may be detained to ensure their own safety and that of others.

Placement in an adequate facility can be challenging as available capacities fluctuate and are not always known in advance of transporting the individual. Life critical decisions may be made by individuals with limited access to qualifying information.

- How can we create a real time inventory of capacity across facilities (across Counties)
- How can the decision about the need for and nature of the recommended detention be supported, how can decision risk be mitigated

Emerg. Med. Detention – Research Sources

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Topic	Author	Source/Link	Comment
Emergency Medical Detentions statutes	Wisconsin Legislature	https://docs.legis.wisconsin.gov/statutes/statutes/51/15	Legal context for EMD
WI updates statutes on EMD	Quarles Law firm	https://www.quarles.com/publications/wisconsin-legislature-amends-emergency-detention-statute/	Commentary on recently enacted changes to the State statutes (great place to start reading)
Milwaukee has highest rates of EMD	Journal Sentinel	http://archive.jsonline.com/news/milwaukee/Milwaukee-County-has-the-highest-known-rate-of-emergency-detentions-in-the-US-197321381.html/	Article with helpful context and statistics, focused on Milwaukee
Emergency Detention Pilot Program	State of Wisconsin	https://legis.wisconsin.gov/lab/media/2677/17-21full.pdf	Introduction to EMD programs in the State

Emerg. Med. Detention – Research Summary

EMD are a complex multi-stakeholder process

Each stakeholder in this extremely challenging situation faces their individual issues

- The perspective through which this issue came to us is that of law enforcement. The process in general, but specifically after recent changes to WI statutes, places a significant time burden on LE
- On the other hand there are the medical and mental health providers involved in the process with a primary concern for patient safety, appropriateness of diagnosis and treatment
- Potentially most critical, but often overlooked, is the perspective of the patient and their relatives, often lacking information in an extremely stressful situation

Wisconsin has recently implemented several changes to the process

- A pilot program and changes to the statutes were implemented within the last year, creating a modified context for the various stakeholders (see detailed article in research overview)

No links of technological solution found (yet)

- Our research has not turned up any technology solutions for the EMD process itself. There is a lot of work out there on using big data and AI in the diagnosis and predication of mental health issues, but that is a different topic that falls into the Healthcare/Clinical space, not into the responsibility of the County

Emerg. Med. Detention - Problem Definition

Team focused on a specific aspect of the process

- In the case of an emergency detention, where the officer has deemed it necessary for inpatient evaluation...
- How does the crisis team find an available and appropriate BHU (Behavioral Health Unit)?

How can we improve on currently manual process to find available beds usually via phone calls (often not enough beds available because of a lack of psychiatrists)?

If beds in multiple facilities are available, how do they select the most appropriate BHU?

Considered additional problems:

How can individual best be assessed for decision to admit/not?

- Could an evidence based model of mental health commitments support the current assessment process?
 - What/how performed by officer in the field
 - What/how performed by doctor at the BHU
- What role could telemedicine play in the process?

Idea Profile: Real Time Database

What is the basic idea?

Real time database of available BHU beds. Data is available to the Crisis Teams, but not available to competing hospitals. Database must have an integration endpoint available, and the security to protect private information from a hospital perspective. No Personally Identifiable Information is included in this system

How is technology being leveraged?

- Create a software Integration point for ingestion of data
- Pull data from source system of bed data in each hospital (e.g. ETL Process)
- Cloud based system for easy access

What benefits are derived?

- Time savings for law enforcement, patient, and Crisis Team. (Saving Money, avoiding overtime, shrinking needed staff)
- Improved patient experience
- Best use of the 72 hour time limit for probable cause hearing, to actually help the patient instead of waiting too long

Starting point only, needs further work

What's next?

- Solution is only valuable if the various BHUs participate in it, need to explore their needs and perspective
- Who would fund the solution (benefit accrues across many stakeholders in small increments)
- Technology is not complicated, leveraging well established capabilities

Idea Profile: Mobile App Interface

What is the basic idea?

Mobile Application that gives access to the real time database for Crisis Teams to do their searches. After a BHU is suggested, phone number to contact the correct department or individual at the BHU directly is presented and one click away.

How is technology being leveraged?

- Mobile Applications
- Cloud Connectivity
- Voice Activation (such as Alexa, Google Voice, Siri, Cortana)

What benefits are derived?

- Ease of use to improve speed
- Availability even outside of the call center
- Quick contact with the BHU for verification of availability.

What's next?

- Relatively simple extension of the prior idea, but entirely contingent

***Starting point only,
needs further work***

Idea Profile: Matching Optimization

What is the basic idea?

What is the optimal BHU to take the patient to based on location, behaviors exhibited, age compared to the BHU capabilities. This takes into account how long it takes to be admitted at each facility, and balance patients to facilities based on potential future need for those BHU's.

How is technology being leveraged?

- Integrated into Mobile App
- Machine Learning (Artificial Neural Network) drawing on BHU and case characteristics and history of comparable cases as well as prediction of other incidents

What benefits are derived?

- Optimized usage of facilities, saving them money
- Better match of facilities to patient needs
- Optimized usage of law enforcement time, saving them money

Starting point only, needs further work

What's next?

- AI development and training would require access to data sets from BHUs
- Case characteristics have to be available to the Crisis team and fed into the app
- Significantly more complex feature of the app, need to weigh incremental benefit vs. development cost

Idea Profile: Tracking of Outcomes

What is the basic idea?

Data collection of what actually happens when a patient gets to a BHU, for future decisioning based on past performance. This is based on feedback from the Mobile Crisis Unit and the Officers involved when things go wrong.

How is technology being leveraged?

- Web Application to Collect Feedback
- Store data, create Database with historical info
- Use data to feed into Machine Learning from previous element

What benefits are derived?

- Saving Officer time
- Saving Crisis Team time
- Bring confidence that the patient is being sent to the right place that really does have a bed available

Starting point only, needs further work

What's next?

- Feedback feature can be added to the mobile app with or without the AI capabilities from prior element
- How will this feedback be appended or combined with case data (may not have to be appended, but needs common identifier)
- Are BHUs open to this “evaluative” element?

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Internet of Things and AI Use Cases

Internet of Things and AI sessions	Facilitators
Optimized Sheriff's Patrols	Joe Bashta (Axicor) and Regi George (nAlytix)
Drones in Public Safety	Oliver Buechse (AAIW) and Adam Hechtman (Microsoft)
Winter Road Maintenance	Greg Belcher (Exosite) and Doug Barton (Hyperinnovation)
Sensor based Road Maintenance	Rhommer Varilla (SafeNet) and Eric Franz (Concurrency)
Distributed Sensor Network	Kurt Hahlbeck (AAIW) and Ryan Carlson (NextMile IoT)

Outcomes - Setting Realistic Expectations

- We developed an incoming hypothesis for each use case based on a discussion with Brown County leadership
- We conducted limited background research on each use case, mainly for the benefit of our facilitators to make them familiar with the topics and technology solutions that are already in the market. This research does not claim to be all encompassing and may have missed key articles or points of view.
- We analyzed the background research to point out key problems within each use case. These were once again starting points for our facilitators with no claim of completeness.
- The participants in each working group spent one hour as a team to describe/refine the problem. In some cases we identified multiple aspects of a problem, in some cases the groups decided to focus on one particular aspect.
- In the afternoon, the groups spent two hours on visioning and idea generation. It is important to recognize that we did not have professional consulting teams work on these use cases for weeks or months, but we had real world practitioners (Deputies, Social Workers, Highway Maintenance Staff, etc.) spend TWO HOURS on the issues.
- We view the outcomes as a starting point for further discussion and we are very proud of the wide range of suggestions the participants came up with in such a short amount of time.

How we are Documenting the Outcomes

Slides pertaining to each section are kept largely within this color scheme



This is usually a brief statement which captures the original thinking on the problem
(brainstormed during the identification of the 15 use cases)

References to select sources we utilized regarding the use case
A summary of key insights related to the research we reviewed

The outcome of the first hour of team discussion – framing the problem (and if applicable its components) that we are trying to solve

Documentation of the team discussion regarding possible solutions – a wide range of thoughts and formats

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Optimized Sheriff's Patrols Working Group

Initial Hypothesis

- Sheriff units are out on patrol for significant amount of time, creating personnel expense and vehicle wear and tear
- Patrols are based primarily on the experience of individuals and general understanding of risk areas
- There are no prior lean histories or value stream maps available for this process

- How can patrol routes generally be optimized
- How can we generate real-time information about risk factors to help direct patrols
- What role can various sensors play in helping collect relevant information

Additional Context

Notes from a conversation with a Sheriff

- In County X, proactive patrol has been reduced due to manpower in favor of reactive patrol, based on dispatch. As the county grows, there are more reactive incidents.
- Proactive patrol is based on crime analysis, e.g. vehicle break-ins. That analysis of crime trends is not yet highly computerized, could be enhanced significantly. Unless directed, officers use their judgment or briefing content to determine their allocation, based on experience and need (e.g. complaints about speeding or break ins), cover for people on vacations. Highly unpredictable based on having to react.
- Reactive is dispatched by Public Safety Communications (not under Sheriff's purview). Have a system in place to determine which unit to dispatch based on the location of the call and the location and status of the units. Villages have subcontracted staff who act on behalf of Sheriffs office.
- Computer based analysis and giving the officer information could be valuable.

Opt. Sheriff's Patrols – Research Sources

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Topic	Author	Source/Link	Comment
Introduction to Hot Sketch Technology for Police routes	Georgia Tech	https://www.cc.gatech.edu/~stasko/papers/hicss17-hotsketch.pdf	Paper which introduces the basics of police patrolling and a visual technology to organize/provide information
Developing an online cooperative police patrol routing strategy	Science Direct Journal	https://www.sciencedirect.com/science/article/pii/S0198971516303337	Advanced science paper introducing Bayesian Ant-based Patrol strategies
The Future of AI and Predictive Policing	Chantelle Dubois	https://www.allaboutcircuits.com/news/the-future-of-ai-and-predictive-policing/	Overview article about predictive policing and related risks
AI and the future of policing: algorithms on the beat	Engineering and Technology	https://eandt.theiet.org/content/articles/2018/04/ai-and-the-future-of-policing-algorithms-on-the-beat/	Story like article and case study on use of ai in policing
Analyzing Police Patrol Routes by Simulating the Physical Reorganization of Agents	Conference paper	https://link.springer.com/chapter/10.1007/11734680_8	2005 paper on the fundamentals of organizing police routes

Opt. Sheriff's Patrols – Research Summary

Balance of proactive/ planned and reactive activities needs to be considered

- Increasing share of policing activity is reactive based on dispatch rather than based on planned routes. If the trend continues, the relative importance of any form of route planning and AI involvement is reduced
- The group should explore whether any form of AI can support reactive deployment (e.g., who to dispatch, how to reroute following a dispatch)

Various techniques and technologies exist, but may not yet be implemented in rural Sheriff's departments

- Various layers of technologies are principally available, of which the newest generation does rely on AI algorithms. If a department is currently not using any, does it make sense to leap frog to AI or could there be a rationale for an evolution.
- What would be tangible benefits of AI based deployment over conventional technology, over intuitive?

What is the perception within LE and in the public if AI based techniques are utilized?

- Could the use of AI be rejected by LE officers as it reduces their autonomy, assigns a lesser role to their experience and judgment. How could this be overcome?
- Will the public perceive this a step towards Robocop and Minority report if crime prediction is utilized to deploy resources. How can communities be incorporated in this evolution?

Opt. Sheriff's Patrols - Problem Definition

How can we leverage emerging technologies to improve Sheriff's Patrol related activities ranging from the actual preparation and execution of the patrols to supporting functions like Officer Health/Safety and Vehicle Maintenance

How can we create Real-Time Data Feeds and Centralized Data Repository

There is a lack of access to a central database of information, especially real-time to allow patrollers make more informed decisions. This causes them to make decisions based on personal memory and gut feel

How can we monitor officer Health and Safety

Officers are at the forefront of situations (e.g.; domestic abuse, opioid abuse, violent criminal) subjecting them to a psychological and emotional roller coaster with potential adverse impact on near term execution or long term impacts (PTSD). Addressing officer health and safety should be central to new technology adoption among.

How can we provide Real Time Hot Spot prediction

Today, there is little to no computerized support for route/hotspot monitoring. Decisions are made based on personal memory and gut feel. The Sheriff's Department would like to see a data-driven system to support and plan hotspot monitoring and route planning

How can we automate resource intensive Administrative Tasks

The greatest loss of time and productivity for the Sheriff's Department is due to inefficiencies in administrative tasks. Documenting and reporting field activity consumes a lot of the officers' time, which could be better spent in the field.

How can we enhance/create Predictive Vehicle Maintenance

Patrolling puts a lot of wear and tear on patrol vehicles. In addition, due to budgets, there are no extra vehicles on hand for when a vehicle in maintenance.

Idea Profile: Real Time Data Feeds

Movement of criminals

Drone feeds

Dash/body cam feeds

What is the basic idea and benefit?

View movement of known criminals in public spaces: Officers would like to see real-time movement of known criminals in public spaces to analyze and predict behavior and possible criminal activity.

Drone-based patrolling with real-time feeds allowing prediction of hostile situations. They would also like the drones to provide bird's eye of view of accident and crime scenes.

(see drone use case)

Access to real-time body cam and dash cam feeds from other officers in threatening situations so that they could support and back them up appropriately.

How is technology being leveraged?

Installation of cameras at strategic points on streets and neighborhoods and use of **facial recognition** and **AI** predict criminal behavior

More drones to be networked in an **encrypted, low-power wireless network** with store-forward type **streaming service** to be implemented and potentially use **AI** to predict hostile situations before they happen

All cameras to be connected to an **encrypted, low-power wireless network** with store-forward type **streaming service** to be implemented.

Starting point only, needs further work

Idea Profile: Real Time (continued)

Sentiment Analysis

Officer Location

What is the basic idea and benefit?

When officers are interrogating individuals, they would like a system to perform and provide them with real-time sentiment analysis on the individual's behavior, so that they know when he is lying or turning hostile.

Today, when an officer leaves their vehicle, the precise whereabouts of the officer remains unknown and makes it difficult for other officers to provide him or her with timely backup and support. The ability to track officer's physical location will greatly help provide timely support and improve officer safety

How is technology being leveraged?

remote **sensors** that can read temperature and activity within the individual being interrogated along with **AI** and **historical data** to perform accurate analysis. The officers will also need **Augmented Reality** devices to receive feedback on the situation

Officers to wear GPS-based outdoor and Wifi or beacon/Bluetooth based indoor trackers on them. These trackers will need to be connected to an **encrypted, low-power wireless network** and their real-time location will need to be broadcast to all officers in their unit

*Starting point only,
needs further work*

Idea Profile: Central Data Repository and Analysis

Temporal and Place Crime Data

Crime and Accident Patterns

What is the basic idea and benefit?

Access to analyzed temporal crime data so that they can make more informed decisions on the likelihood of a crime being committed at a certain place at a certain time.

Similarly, have information about what type of activity and environment factors could create likelihood for a crime or accident. For example, what is the likelihood that a pothole at the corner of 1st and Main Streets would cause an accident during heavy rains.

How is technology being leveraged?

Central repository of insights potentially generated using **AI** paired with data from other (see prior page) requests to help officers be proactive

*Starting point only,
needs further work*

Idea Profile: Health Monitoring

Read Officer Health and Predict Well Being

Health and well-being supervisor dashboard

What is the basic idea and benefit?

Ability to monitor every officer's physical and psychological well-being and make it available to all other officers in the field so that they can back and support each other appropriately.

Supervisor health portal that will allow them to visualize the mental and physical disposition of their officers.

This will allow supervisors to make decisions on the fitness of the officers to take to the field.

How is technology being leveraged?

Officers to wear **sensors** so that vital and hormone levels can be constantly monitored. Sensors connected to an **encrypted, low-power wireless network** and data returned to central platform for analysis and prognosis generation. This may include **AI**.

Officer health data to be ingested, analyzed, diagnosed using **analytics and AI** and presented to the supervisors using a **visualization tool**.

Starting point only, needs further work

Idea Profile: Predictive Tools

Accident Predictions

Computer Aided Dispatch Feed

Route Planning

What is the basic idea and benefit?

Ability to be at the right place at the right time to ideally, prevent an accident from happening and if not, that at the least be able to respond fast enough to prevent injury or death.

Computer aided dispatch system, that took into consideration real time and pattern data from prior ideas and created an ordered list of hotpots to visit. Real-time adjustment to constantly improve monitoring and reduce disruptions.

Just like today's GPS systems can take into considerations traffic and reroute you, systems that take into consideration hotspot visit intervals, accident predictions and crime predictions when planning routes from one hotspot to another.

How is technology being leveraged?

Sensors on the roads to provide data about road conditions like pot holes, icing, **radars** to read speeds, all connected to a **wireless, low-power network**. Data to be run through **predictive and/or AI models** to predict the potential occurrence of an accident.

Predictive analytics and **AI**-based platform to predict most likely occurrences of events each day or hour and provide a constant real-time feed to the officers on their rounds

Route planning system that **ranks** routes to hotspots based on real-time data provided from previously discussed systems

Starting point only, needs further work

Idea Profile: Automate Admin Tasks

Network devices to trigger each other

Auto tagging and cataloging of feeds

What is the basic idea and benefit?

Today, when an officer arrives at an incident, he or she is required to turn on their dashcam and if he or she activates their taser, he or she has to also turn on their bodycam. These are inefficient and could put the officer's safety at risk. The Sheriff's Department would like to see these devices networked and programmed to be activated automatically. This type of sequenced activation is already available in home devices, like if a Blu-ray player is turned on by a universal remote, it also turns on the receiver and TV.

When an officer arrives at an event there several activities that might take place like interrogations, activation of devices, chases, etc. In the above, we discussed incorporating sensors, bodycam and dashcam feeds. All such activities should be tagged with the incident and catalogued against the incident. Also automate the report generation based on these activities to ease the documentation and reporting for the officers.

How is technology being leveraged?

All devices to be paired using **Bluetooth** or other near field communication protocols and a programmable unit to create activation sequences

AI to analyze and catalog video and an **authoring system** to generate a report based on feeds and data provided

Starting point only, needs further work

Idea Profile: Automate Admin Tasks (Cont.)

Automate Social and News Feeds

What is the basic idea and benefit?

A solution to automate curation and publishing of news feeds to public through social media.

How is technology being leveraged?

AI-based system to collect field activities and curate and summarize it into incidents. The Sheriff's Department should then have the ability to tweak those incident messages and select the ones to **publish on all social media platforms** by the click of a button

*Starting point only,
needs further work*

Idea Profile: Vehicle Maintenance

Driver Behavior

Maintenance Schedules

Vehicle History

What is the basic idea and benefit?

Pattern identification of how driver behavior affects the wear and tear on the vehicle and take appropriate action.

Based on driver behavior and routes, predict mileage and vehicle maintenance schedules so that it can be made available to the shop for automatic service scheduling

Same for predicting residual vehicle value for disposition planning

Ready access to vehicle maintenance history and logs.

How is technology being leveraged?

Sensors to be placed in the vehicle to read and understand driver behavior. Need will also exist to **benchmark** different driver behaviors against wear and tear on the vehicle

Predict analytics and **AI** and a dashboard for visualization

Central data repository and a **dashboard** for **visualization**.

Starting point only, needs further work

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Drones in Public Safety

Initial Hypothesis

- Assessment and documentation of crash sites is a time consuming effort. 3D modeling tools have already cut down the time to collect information dramatically. Currently drones are not being utilized in the process
- What role could drones play in gathering information about traffic, accidents, or other public safety risks
- How could drones be used specifically in crisis situations
- How would the drones be deployed and directed, how would the information flow between drones and deployed units

Drones in Public Safety – Research Sources

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Topic	Author	Source/Link	Comment
Public Safety Drones	Center for the Study of the Drone	http://dronecenter.bard.edu/public-safety-drones/	Great overview of drone use in public safety including data on who bought which drone and sample use cases
Public Safety	DJI	https://enterprise.dji.com/civil-protection	Website with examples by the leading provider of Public Safety drones
Public Safety Drone Services, Training, Consulting and Products	ABJ	https://abjdrones.com/public-safety-drone-services/	Website with value added information on all things public safety drones by a provider
How drones can be used in Public Safety	The Drone U	https://www.thedroneu.com/blog/drones-can-used-public-safety/	Good overview article on the subject
Law enforcement drone policy	Power DMS	https://www.powerdms.com/blog/law-enforcement-drone-policy/	Provider/consultant article with considerations on drone strategy and drone policy
Drones in law enforcement	The Drive	http://www.thedrive.com/aerial/15092/drones-in-law-enforcement-how-where-and-when-theyre-used	Overview of drone usage and use cases
2018 Guide to Drones in Law Enforcement	Policeone.com	https://www.policeone.com/2018-guide-drones/	Series of articles from a Police perspective

Drones in Public Safety – Research Summary

Drone usage in Public Safety is increasing rapidly

- Hundreds of agencies across the U.S. are already using drones, including several in Wisconsin. The number of use cases is widening but focused on surveillance, search and rescue, traffic site analysis and crime scene investigation, but also crowd monitoring and active shooter scenarios

A substantial provider ecosystem exists

- Drone manufacturers, resellers and consultants are offering not only the hardware, but also information, education, training, policy development support and strategy consulting

Discussion is shifting from feasibility to regulation and community support considerations

- With proven technological capabilities across various use cases, the key issues regarding drones will morph from experimentation and exploration towards more comprehensive rules and policies governing if/when/how drones can and should be utilized
- Getting community support and overcoming resistance/concerns is a key topic for agencies

Drones in Public Safety - Problem Definition

What are the key opportunities, risks, and implementation considerations in launching a Public Safety Drones program?

What are the use cases for drones in public safety, what capabilities do drones need to have in each use case?

What are data capture, transmission, aggregation, distribution, and consumption considerations?

What are limitations and concerns that set boundaries for drone usage and programs?

What are program launch requirements and steps?

What are opportunities for collaborative ownership and usage (within/across counties, or with private sector)?

Variety of Use Cases

- The group brainstormed on potential use cases for drones and came up with an impressive list. To push our thinking further we inventoried the different needs that a drone would have to have in each use case (sensor, flight, and data capabilities). The significant variety of features across use cases illustrates the complexity in making drone purchases that are not single purpose.
- Some of the observations included
 - While most think of drones as flying objects, there are also use cases for terrestrial drones or even submersibles. Flying drones don't have to be quad drones. They can be fixed wing, suspended by a balloon, gas vs. electric, etc. – the selection has to be a function of the envisioned uses
 - Drones will primarily be equipped with sensors, to capture information. There are however also several use cases in which the drone needs broadcast/communication capabilities or even the ability to deliver items. Considering modular designs may be important to not create very expensive super drones and retain flexibility across use cases
 - What happens with the recorded data is a critical consideration. Is it needed in real time, does it need to be preserved (if so, substantial data storage capacities may be required and it will be subject to Freedom of Information Act inquiries and related redaction work), etc.
 - Data security and data risk management is often overlooked. Drones may be vulnerable to hacking already at the point of data capture
- We think of this list as a starting point to help those making drone purchases and also to encourage collaborative programmatic thinking across agencies

*Starting point only,
needs further work*

Potential Drone Use Cases (1/2)

Use case	Type of drone	Sensor capabilities	Flight capabilities	Data capabilities	Other
Traffic control	Tethered, highly visible (signal effect)	Visual, GPS	Long duration, medium altitude	Streamed	
Accident (site) management or crime scene mapping	Aerial	Visual High-Res LIDAR, Thermal, possibly air quality	Low altitude	Recorded	Hazmat considerations
Situation management	Aerial or Terrestrial or combo	Visual, Audio, Thermal, Broadcast/Coms	Varied, may need non-line-of-sight capabilities, durable, collision avoidance	Streamed and/or recorded	Delivery capabilities
Crowd control	Aerial or Terrestrial (different drones)	Visual, Audio, Broadcast/Coms	Medium Altitude, High Speed	Streamed and/or recorded	Delivery capabilities
Event/crowd monitoring	Aerial, Quad, Tethered	Vision w. Pan, Tilt, Zoom, Night vision, Shot Detection	Multiple hours, high stability, multi weather usage	Local Stream, temporary retention	Dynamic layouts (modular design)

Potential Drone Use Cases (2/2)

Use case	Type of drone	Sensor capabilities	Flight capabilities	Data capabilities	Other
Search and rescue	Aerial and/or Aquatic (different drones)	Vision with pan, tilt, zoom, Night vision, Thermal, Audio, Broadcast, GPS	Multiple hours, high stability, multi weather, extended range	Disconnected and real time, large storage (to review footage again)	Backup batteries, consider features of floating or submersible drones
Fire	Aerial and/or terrestrial (different drones)	Vision with pan, tilt, zoom, Thermal, Environmental	Medium altitude, high maneuverability	Most critical is real time transmission, large storage for review/analysis	All equipment needs to be heat resistant
Emergency management/ post disaster assessment	Aerial and/or terrestrial (different drones)	Visual (high resolution), Thermal, Mapping	High altitude, long range	Data capture is most important	Collaborate with insurance drone data

Other Key Considerations

- What is the business case for a drone program
- Who owns the drone, who can access it/use it
- Licensing is required to pilot a drone (line of sight flying, night time, flying over people)
- FAA regulations and exceptions need to be carefully studied and considered, e.g. log of flight time
- What other regulations impact a drone program (e.g. Freedom of Information Act requests)
- The budget for the drone program needs to cover not only purchase and initial cost, but also the cost to sustain the program (additional training, data storage/management/redaction), in particular FOIA requests on very large data volumes can become a meaningful expense
- What are the insurance requirements for the drone/flying the drone
- Privacy and community response are a key concern and may offset the benefits

Making the Case – An Example

A key exercise we went through is “making the case”. What are the reasons to have (understand the possibilities, articulate the benefits) vs. reasons not to have a program (know the limitations, how can they be mitigated), how do they influence the selection. We used a real life scenario in our group as the basis

Use Case

- Law enforcement (accident sites, situation management, crowd monitoring), sample cost \$20-25k for drone, \$6k for training, plus insurance and cost for data management

What are the benefits

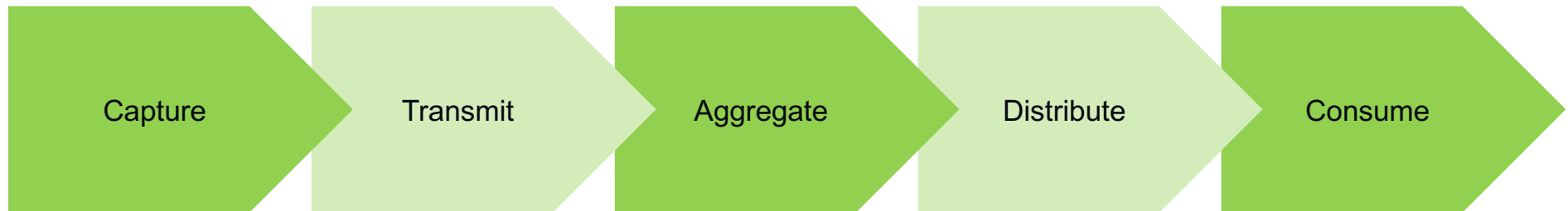
- Ensuring a higher degree of public safety by obtaining additional contextual information to improve situational response and long term learning from enhanced analysis
- Reduce the risk/danger to a human (e.g. in situation management)
- If applicable, it could be a replacement of other aerial tech at a lower cost and with a faster speed of deployment

What is involved

- We need to define the equipment specifications and acquire the requisite skills via training/certification. An access strategy has to be developed which may specific cost sharing, pooling of equipment, outsourcing of certain aspects.
- Create a policy for the agency/county that clarifies the operation of the drone and is compliant with all applicable federal/state regulations
- The data lifecycle has to be fully supported (see next page). Data security is a key concern. Need to have a reliable chain of custody.
- Demonstrate an understanding of the risks involved through a thorough documentation and assessment of all risk types (e.g. liability for accidents)

*Starting point only,
needs further work*

Data Lifecycle in a Drone Program



- Clarify the specs, stream vs. record
- Encryption capabilities at point of capture

- How is data being transmitted, how is it encrypted

- Data storage platform (cloud vs. remote)
- Archiving decisions
- Compliance with State and other regulations
- Stitching of images with goal of modeling

- Encryption
- Making data accessible to various stakeholders
- Handling Freedom of Information requests
- Redaction

- High share of immediate usage
- FOIA discovery
- Searchability of visual data



- Chain of Evidence throughout

Collaborative Drone Program Example

Example

- Collaboration occurred in a City (single budget authority)
- Police and Fire Department were the leads of exploring a drone program, but other departments were considering it also for Parks or Waste Management
- A drone purchase was first proposed in the 2015 budget, but only once the other departments joined in (a committee of 10 people agreed on the outline) and offered to share the cost was it finally approved, it will be in the field in 2019 with 10-20 trained pilots across different departments

What to consider in forming a collaboration

- Single budgetary authority makes collaboration much easier
- Collaboration within the same geography (e.g., County and City) allows for easy access and deployment vs. having to move the drone
- Cross County collaborations may exist as well (e.g. regional bomb squad), but relying on funding from multiple sources complicates the effort

How to get started

- Find willing partners, hold educational meetings and identify various use cases
- Identify a system/equipment that can address the majority of needs. Start with less expensive drones to practice/train flight skills
- Develop a cost allocation model; making the case to constituents focused around positive uses

How to manage

- In the example, Police and Fire Departments hold on to high end drones, only qualified pilots fly the drones, shared software for maintenance (e.g. battery usage)
- Development a cost sharing logic for ongoing expenses

The Digital County Journey

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- **Winter Road Maintenance**
 - Sensor Based Road Maintenance
 - Distributed Sensor Network
- Blockchain Use Cases



Winter Road Maintenance Working Group

Initial Hypothesis

- During winter maintenance roads are cleared by the snow plows and salt is applied based on the judgment of the driver
- The total amount of salt used over the winter season is a significant expense to the County
- How could we equip our vehicles with sensors to detect road temperature, road conditions, how can we use stationary sensors to provide information
- How can that information be combined with information about the weather, forecasted conditions, likelihood and timing of re-plowing this section, etc.
- How can the amount of salt deployed be optimized based on the information collected and adjusted to the local needs

Additional Context

Notes from a conversation with a Highway Department

- Microclimate in the county matters in understanding winter maintenance needs and priorities, macro data may not be sufficient
- Route optimization was completed in 2016, DOT central office has the program and the expertise to do it, but they worked with staff and equipment assumptions as is
- Drivers have to learn new routes (no real time guidance in place)
- Equipment may not be ready, huge differences across counties
- MDSS software has many of the capabilities (Maintenance Decision Support System), DOT contact, not used very much due to staff time and expertise.
- Snowstorms are not rocket science, you deal with them as they come

Winter Road Maint. – Research Sources

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Topic	Author	Source/Link	Comment
Artificial-Intelligence-Based Optimization of the Management of Snow Removal Assets and Resources	Midwest Transportation Consortium	http://www.intrans.iastate.edu/reports/SnowplowReport.pdf	A study from 2002 (no typo) on the subject. They developed an actual technology back then...
Artificial intelligence laser snow plow could keep you safe on the roads this winter	Newsweek	https://www.newsweek.com/artificial-intelligence-laser-snow-plow-winter-727311	Discusses the use of lasers to detect chemicals on the ground and chose appropriate de-icer
Snow-plow route planning using AI search	IEEE conference paper	https://ieeexplore.ieee.org/document/6084095/	Paper from 2011 discussing a technology solution
Technology reshaping snow	SIMA company website	https://www.sima.org/news2/2017/10/01/technology-reshaping-snow	Milwaukee Company specializing in snow removal, proposing IoT approaches (little specificity, but a lot of resources on website)
Five ways technology can help us cope with blizzards	Washington Post	https://www.washingtonpost.com/news/innovations/wp/2015/01/27/five-ways-technology-can-help-us-cope-with-blizzards/?noredirect=on&utm_term=.660ddcec4b1f	Overview article with various approaches

Winter Road Maint. – Research Summary

Current approaches are static not dynamic

- Initial conversations with one highway department in WI highlight that route planning is an event that occurs every few years with DOT support at the state level, but once routes are established and drivers have learned them, they are applied regardless of conditions
- No real time information is being collected or utilized other than what decisions the driver makes based on intuition and experience

AI based solutions and working technologies are already in the market

- Key articles on the subject go back to as early as 2002. Advances in technology should make the application that much more viable today.
- It is not clear why this technology has not found more widespread adoption

Combining IoT and AI may be the key to a breakthrough

- IoT solutions focus on the truck itself to collect and report information back to a central database, but also on various sensor technologies on the truck that help it collect information (e.g. lasers to determine dangerous chemical residue from prior salt application)
- AI plays a role in combining complex weather data with the information being collected real time

Winter Road Maint. - Problem Definition

How can we leverage digital technologies to enhance

- **Safety (for the public and workers)**
- **Satisfaction (safe roads)**
- **While being cost effective**

How can we improve the accuracy of forecasts to improve lead time

What information regarding actual conditions on roadway can we gather via sensors (e.g., for moisture and weather detection)

How can we sense and meter the distribution of salt (and other materials) and provide recommendation on dosage to drivers based on conditions

How can Counties secure data sharing (e.g. Cameras, Networks) for coordination

How can we change the scheduling towards dynamic route planning based on circumstances while leveraging knowledge of road conditions and obstacles of drivers

Idea Profile: Forecast Accuracy

What is the basic idea?

Accuracy of forecasts related to snow events and/or snow storms to improve lead time

How is technology being leveraged?

- Weather Services
- MDSS (Ittris); crowd sourced from authority; automating data collection
- Cameras

What benefits are derived?

- Lead-time for driver resources
- Scheduling dynamics (duration, accurate rate estimates)
- Material selection (e.g. Salt)

Starting point only, needs further work

What's next?

- x

Idea Profile: Roadway Sensors

What is the basic idea?

Sensors for moisture and weather detection (actual conditions on roadway)

How is technology being leveraged?

- RWIS
- Instrument high risk areas like bridge decks, hills, curves, or boundaries
- Alert and threshold monitoring

What benefits are derived?

- Event-based triggering of attention (set and forget and alert)

Starting point only, needs further work

What's next?

- x

Idea Profile: Salt Distribution

What is the basic idea?

Sensing and metering the distribution of salt (and other materials); Recommendation dosage to drivers based on conditions including traffic

How is technology being leveraged?

- Bi-directional information flow and communications on road conditions and recommendations for “recipe”
- “Studies” to back up decision and create a “safe harbor” against liability

What benefits are derived?

- More precise application rates to conditions
- Cost savings

Starting point only, needs further work

What's next?

- x

Idea Profile: Cross County Collaboration

What is the basic idea?

Secure data sharing between counties (e.g. Cameras, Networks) for coordination

How is technology being leveraged?

- Secure, crowd-sourced (private/public) networks crossing county and state borders

What benefits are derived?

- Maximum lead time for planning and execution
- Lower costs than building entire network

What's next?

- x

*Starting point only,
needs further work*

Idea Profile: Dynamic Scheduling

What is the basic idea?

Changing behavior/obstacles (scheduling, dynamic route planning based on circumstances; knowledge of road conditions and obstacles of drivers)

How is technology being leveraged?

- Route optimization
- Convergence of data about weather events, road conditions, and anticipated traffic

What benefits are derived?

- Optimization of routes specific to each event
- Safer roads
- Lower cost

Starting point only, needs further work

What's next?

- x

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Sensor Based Road Maint. Working Group

Initial Hypothesis

- Road maintenance and repair is a very significant cost item for the Counties
- Roads are prioritized for maintenance and repair based on history and visual inspection of repair need
- How can we utilize stationary sensors or information collected from moving sensors (e.g. cameras on service vehicles) to assess road conditions and maintenance/ repair needs
- How can we optimize the maintenance and repair schedule based on the information that has been collected and the actions that have been identified

Additional Context

Notes from a conversation with a Highway Department

- Baseline: every two years have to do road ratings, through Wisconsin information system for local roads, data management tool for decision makers
- We go out, some firms do the mapping, but it is way cheaper for us to drive it. Our ops manager is out there looking for a variety of things, rating the road on a scale from 1-10, 3 is the worst we get to. On and off for a few weeks, half a week for three weeks
- Using consultants is too expensive. Having internal staff do it has advantages. They take the data and create a six year capital plan. Paired with traffic density from state data base (automated counts through tubes on the road). Set six year plan and update it every year
- Asphalt roads can die fast towards the end of the lifecycle, need to be moved up
- What if we could use google earth to do the assessment based on their, having the google people in the room would be great, what if we could do it with the drones of the fire department
- Bridges need to be assessed every two years as well through Federal program, different system. Rate on a structural number, if less than 50 get Federal help for Financing. Every piece of the bridge has to be inspected.
- Critical infrastructure: if we had smart bridges to detect movement, friction, and trigger alarms. If a girder is tripping. This would be a big advancement

Sensor Road Maint. – Research Sources

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Topic	Author	Source/Link	Comment
Automated Sensing System for Monitoring of Road Surface Quality by Mobile Devices	Science Direct Journal	https://www.sciencedirect.com/science/article/pii/S1877042814000585	2014 article describing road condition data collection through smart phone app monitoring anomalies
Sensor vehicular platform for road maintenance	IEEE	https://ieeexplore.ieee.org/document/7577114/	Similar concept from a different source
Continuous road damage detection using regular service vehicles	Christoph Mertz	https://www.ri.cmu.edu/pub_files/2011/10/RoadMonitor_Mertz_ITSWC2011_final.pdf	Article describing service vehicle mounted light sensors and cameras
Use of Mobile Sensors and Maintenance Decision Support for Automated Road Condition Reporting	Minnesota Department of Transportation	https://www.nwpassage.info/projects/phase5/downloads/proj54-mobile-sensors-report.pdf	Comprehensive assessment of current road observation techniques, emerging technologies, and recommendations
Using drones to repair roads with 3d printing	You Tube video, University of Leeds	https://www.youtube.com/watch?reload=9&v=mcK1xGfDWg0	Video demonstrating a drone with integrated repair capabilities (concept)
From maintenance to management: drone-mapping hits the road	Pix 4D company website	https://pix4d.com/from-maintenance-to-management-drone-mapping-hits-the-road/	Detailed description of advanced drone capabilities

Sensor Road Maint. – Research Summary

Three fundamental assessment technologies available

- Drone technologies map the roads and any repair needs from the air (if visibility is given) through high resolution imagery, potentially additional technologies (e.g. laser)
- Sensors attached to service vehicles which travel the roads regularly collect and transfer information in real time
- Mobile app based assessment detects anomalies and reports them back

Need to explore the benefits of real time and continuous information vs. cyclical

- Current assessment cycle is two years (with repairs occurring throughout the cycle), only if accelerated changes/damages occur will assessment be updated. No predictive component (assess as is)
- What additional value can be created from collecting real time data, feeding changes into predictive models, etc. Is this all just nice to have because the capacity to repair is not enhanced

Extending the use of drones and robots to the repair process would be a true game changer

- Most radical approach is to think about drones, robots, or autonomous vehicles playing a greater role in the actual repair of the damage. 3D printing, autonomous transport of required materials, etc. can be explored

Sensor Road Maint. - Problem Definition

How can we include modern sensor technology and analytical tools to optimize the assessment and execution of road repair needs?

How can we utilize stationary sensors or information collected from moving sensors (e.g. cameras on service vehicles) to assess road conditions and maintenance/ repair needs

How can we optimize the maintenance and repair schedule based on the information that has been collected and the actions that have been identified

Creating a Shared Problem Understanding

There are many things that contribute to road deterioration

- Weather
 - Temperature volatility, particularly in the Spring thaw
 - Amount of snow, ice, rain
 - Sun (Ultraviolet) affects on road chemistry
- Traffic patterns
 - There is limited data here, mostly collected via traffic strips
- Truck (and heavy equipment from farms or manufacturers)
 - weight, distribution on axels, traffic patterns
 - There is limited data here, mostly collected via weigh stations
 - Farm equipment not caught via weigh stations
- Varying levels of effectiveness of choice of road composition
- Varying levels of quality of road replace & repair which sometimes is done by private entities.
- A pothole, and multiple repairs are an indicator of the substructure failing.

- Roads are generally manually inspected by most regions on an annual basis
 - Generally it was determined that effort of taking a couple of weeks for a couple of people to drive all routes was sufficient to identify which roads needed work. These observers tended to have a lot of history/experience on the roads and can anticipate, over time, which roads are going to need repair.
- Too often band-aid fixes are applied instead of a more comprehensive fix that involves replacement instead of repair.
- There was an overwhelming cloud of budget constraints that dictated what roads get addressed and whether or not it is a repair or replace

Range of Maintenance Decisions



- Typically this involves changing traffic patterns and posting weight limits on a road.
- Additional considerations may be about road composition and methods of building the road

- Typically this is a pothole fill or similar repair.
- It is generally seen as a short-term fix, many times the repair is done frequently.
- Density of repairs indicates substructure failure

- Comprehensive replacement of a road.
- Seemingly a last resort due to budget constraints.
- Very disruptive and often changes traffic patterns that result in subsequent damage to other roads

- Do nothing. Largely a budget decision

- Budget was an overwhelming constraint to the decision options; consensus was that the budgeting process was over simplified and largely based on last year's budget.
- There was general consensus that an analytics model that took in more and better data could articulate a better ROI if road maintenance was more proactive than reactive.

Idea Profile: Optimized Data

What is the basic idea?

- Acquire better data (weather, traffic, weight) from
 - Partner sources (e.g.; Google)
 - Capture new data sources
 - Capture more, more complete, and historical data
- Share data through federal system

How is technology being leveraged?

- Range of assessment technologies available to capture road condition data (mobile app crowd sources, mobile device capture, LIDAR)
- Build data repository and analytical tools to detect relevant patterns

What benefits are derived?

- Better and more consistent maintenance decisions and prioritization
- Could potentially create a market for data collected (or share cost of data procurement across multiple purposes)

Starting point only, needs further work

What's next?

- Operating under current budget constraints, many participants are reluctant to even consider higher cost assessment techniques
- The initial key is “can we make better decisions with the data we have or with data that is available at low/no additional cost”
- Building an analytical model to prove out cost impacts is critical

Idea Profile: Decision Analysis

What is the basic idea?

Capture data on historical decisions and subsequent outcomes/related cost

How is technology being leveraged?

- Build analytical model (ideally across Counties) and derive key drivers of decision effectiveness

What benefits are derived?

- Inform ROI assessment to drive both short term funds allocation as well as long term resource allocation to budgets

Starting point only, needs further work

What's next?

- Directly connected to prior page

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- **Distributed Sensor Network**
- Blockchain Use Cases



Distributed Sensor Network Working Group

Initial Hypothesis

- Counties are responsible for a large network of roads, many of which also require illumination. The use of lights is typically scheduled based on certain times, not based on actual traffic on the streets.
- The existing infrastructure of light poles throughout the county could potentially be a valuable asset in terms of utilizing it for various sensors (e.g. weather) or for other technologies (e.g. micro towers for telecom).
- How can we design a smart sensor network throughout the county to help us collect relevant information (e.g. weather, traffic)
- What types of sensors have the highest value for the county (e.g. light management, flow controls)?
- Which other entities have an interest in utilizing county infrastructure, how can these interests be aligned to help fund a distributed sensor network?

Dist. Sensor Network – Research Sources

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Topic	Author	Source/Link	Comment
Smart Cities empowered by IoT sensor networks (Infographic)	Lanner company website	https://www.lanner-america.com/blog/smart-cities-iot-sensor-networks/	Basic intro and nice graphics to understand range of sensors
Wireless Multi-Sensor Networks for Smart Cities	IEEE Sensor Journal	https://ieeexplore.ieee.org/document/8003265/	Case study from Budapest where multi sensors were installed on the city's lighting system
Wireless Sensor Networks in Smart Cities: The Monitoring of Water Distribution Networks Case	Diva Portal	https://www.diva-portal.org/smash/get/diva2:920737/FULLTEXT01.pdf	Case study on sensors in water distribution system
Wireless sensor networks and their applications in geomatics: case study on developments in developing countries	Springer Link	https://link.springer.com/article/10.1007/s12518-010-0022-0	Case study from India with broader focus on sensors in rural settings (developing country context)
What is 5G?	Skyworks company website	http://www.skyworksinc.com/Products_5G.aspx?gclid=CjwKCAjw-dXaBRAEEiwAbwCi5o8swJARYCr0tW3mbkGsqdmlIK6KaJSer0ipZtUfYm_f2fgjeFxSxoCa8EQAvD_BwE	Tutorial on 5G
Wireless sensing modules for rural monitoring and precision agriculture applications	Taylor and Francis Online	https://tandfonline.com/doi/full/10.1080/24751839.2017.1390653	Introduction to the technology challenges of rural networks (e.g. transmission over longer distances)

Dist. Sensor Network – Research Summary

Sensor networks have been focused on cities, what changes in a County context?

- Most articles about smart sensor networks are focused on cities. With the density there it makes more sense to install connected networks with multiple sensor capabilities. Issues for counties may be different (e.g. pollution, congestion, flooding may be of lesser concern). What are the top sensor priorities for a county? How would city and county networks supplement each other?

Extremely wide range of sensors are available, how to prioritize and develop a benefit model?

- Physical, chemical, biological aspects can be detected via sensors, applying to weather, pollution, infrastructure, traffic and movement of people, water management, lighting management, etc.
- Counties will need an efficient way of identifying options, assessing cost benefit trade-offs, and making decisions. Otherwise this can become an esoteric topic with a “does not apply to us” outcome

Could the solution lie in alliances with commercial interests?

- Counties own valuable infrastructure, e.g. lighting poles. Cellular providers need resources for their 5G networks. Could there be a trade-off to combined multiple sensors with 5G technology to create a funded network.
- Another key user of data in the rural context is agriculture. Farmers will need to build capabilities to connect their devices and receive data. Could there be an alignment of interests?

Dist. Sensor Network - Problem Definition

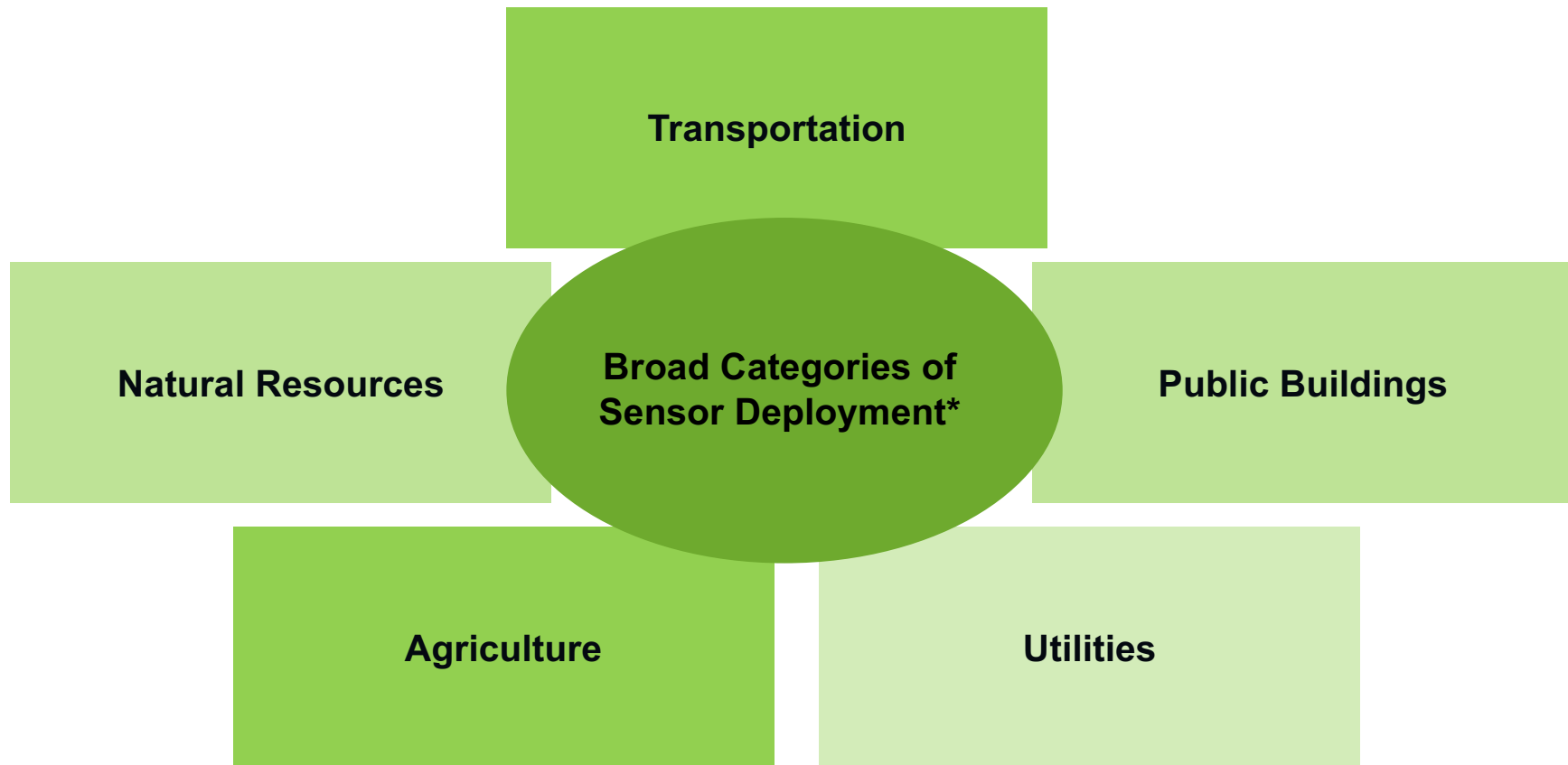
If a County had the opportunity to invest in a sensor network, which types of sensors would provide the highest benefit?

The group approached the topic in a more foundational format, taking inventory of various categories of sensor use and exploring related benefits/current pain points as well as stakeholders

Further work would be required to develop a solution for the original problem definition.

Areas of Sensor Application

*Starting point only,
needs further work*



* Not included here: Law enforcement, see use case on Sheriff's Patrols for examples of sensor deployment in LE

Category Assessment: Transportation

Types of sensors/ applications

- Public vehicle sensors (location, cameras, road assessment)
- Rail line or rail crossing sensors
- Ground infrastructure like roads, bridges (motion, speed, tension, also weather)
- Electrical infrastructure like street lights, traffic signals, road signs (motion, cameras)

Key benefits/gains to be achieved

- Improved public safety, saving lives
- Better traffic awareness, improve flow, enhanced traffic planning
- Asset tracking and indicators of condition/risk
- Cost savings from operating on demand (e.g. lights)
- Lower cost of data collection vs. current approaches (e.g. traffic flow assessment)
- Improved (predictive) maintenance of vehicles, lower cost
- Maintenance indicators for roads/bridges, can help with prioritization of repairs to avoid costly fixes
- Also: see use cases under Sheriff's Patrols for various uses of cameras in public spaces

*Starting point only,
needs further work*

Stakeholders

- Law enforcement
- Highway Department
- Highway Commissioner
- Zoning Commissioner

Category Assessment: Public Buildings

*Starting point only,
needs further work*

Types of sensors/ applications

- Various buildings in consideration (Administration, Court House, Stadium, Parking Ramps/Garages, potentially collaborate with schools)
- Sensors can be related to vehicle/foot traffic, HVAC monitoring, maintenance of building infrastructure
- Also: crowd assessment during events/games
- Buildings can be utilized as “stations” for array of sensors (e.g., weather, cameras, air quality)

Key benefits/gains to be achieved

- Improved energy efficiency in buildings (lighting, heating, AC)
- Predictive maintenance for equipment vs. repairs
- Data collection contribution for weather, public safety, crime fighting
- Monitoring of building utilization (creation of enhanced financial model, cost allocation)

Stakeholders

- County Clerks/Admin
- Assessors, inspectors, maintenance teams
- Public Works

Category Assessment: Natural Resources

*Starting point only,
needs further work*

Types of sensors/ applications

- Waterways (flow indicators, water quality, level)
- Parks/trees (precipitation, soil moisture, cameras, air quality, motion)

Key benefits/gains to be achieved

- Identify ecological baseline, issues, incidents (e.g. agricultural run-off, industrial incidents)
- Monitor water quality
- Manage deployment of resources for maintenance
- Cost savings from watering as needed/appropriate
- Inform flood management plans with enhanced data
- Make data available to public for enhanced transparency on water/air quality

Stakeholders

- DNR
- Parks and Recreations
- Land conservation interests
- Not for Profits
- Public
- UW Extensions

Category Assessment: Agriculture

Types of sensors/ applications

- Monitoring in adjacent County properties (soil/water quality)
- Collaboration with farmers on rural asset management (equipment, livestock) – county would be more in a supportive role rather than a direct stakeholder
- Make County weather, precipitation, other data available to farmers as it impacts their farm management decisions

Key benefits/gains to be achieved

- Support of agricultural sustainability, indication of support (energy capture, crop yields, social stability, mental health)
- Planning for rural infrastructure (roads, data)
- Monitoring of water quality, understand zoning requirements
- Inform agriculture related law, regulations, rules

*Starting point only,
needs further work*

Stakeholders

- DNR
- Agricultural trade groups
- Farmers
- Zoning
- Health Department
- UW Extension

Category Assessment: Utilities

Types of sensors/ applications

- Energy assets (wind, solar, traditional)
- Data assets (fiber)
- Water infrastructure (flow, quality)
- Lighting, Phone
- In some cases the County is not the asset owner, but a collaborator with Utility companies

Key benefits/gains to be achieved

- Improved information about utilization of various assets to inform maintenance, investment decisions
- Lower cost of data collection vs. traditional methods (e.g. smart meters)
- Efficiency of water usage, Identification of leaks/losses (e.g. broken or damaged pipes)
- Improved prediction of disaster impact/recovery
- Economic development benefits with broad impact on quality of life (access to work)
- Key concern: expanding infrastructure in rural environments often not cost efficient; sensors rely on data transmission capability, big challenge for rural areas

*Starting point only,
needs further work*

Stakeholders

- Economic development partners
- Public utilities

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- **Blockchain Use Cases**
 - Alternative Courts
 - Access to Public Information
 - Secure Information Profile
 - Evidence Tracking through the Court Process
 - Child Protective Services



Blockchain and AI Use Cases

Blockchain and AI sessions	Facilitators
Alternative Courts	Florence Hudson (IIIE) and Chris Carpenter (AAIW)
Access to Public Information	Rhommer Varilla (SafeNet) and Don Cotey (AAIW)
Secure Information Profile	Oliver Buechse (AAIW) and Pete Nohelty (Royal CU)
Evidence Tracking through the Court Process	Brent Leland (AAIW) and Regi George (nAlytix)
Child Protective services	cancelled

Outcomes - Setting Realistic Expectations

- We developed an incoming hypothesis for each use case based on a discussion with Brown County leadership
- We conducted limited background research on each use case, mainly for the benefit of our facilitators to make them familiar with the topics and technology solutions that are already in the market. This research does not claim to be all encompassing and may have missed key articles or points of view.
- We analyzed the background research to point out key problems within each use case. These were once again starting points for our facilitators with no claim of completeness.
- The participants in each working group spent one hour as a team to describe/refine the problem. In some cases we identified multiple aspects of a problem, in some cases the groups decided to focus on one particular aspect.
- In the afternoon, the groups spent two hours on visioning and idea generation. It is important to recognize that we did not have professional consulting teams work on these use cases for weeks or months, but we had real world practitioners (Deputies, Social Workers, Highway Maintenance Staff, etc.) spend TWO HOURS on the issues.
- We view the outcomes as a starting point for further discussion and we are very proud of the wide range of suggestions the participants came up with in such a short amount of time.

How we are Documenting the Outcomes

Slides pertaining to each section are kept largely within this color scheme



This is usually a brief statement which captures the original thinking on the problem
(brainstormed during the identification of the 15 use cases)

References to select sources we utilized regarding the use case
A summary of key insights related to the research we reviewed

The outcome of the first hour of team discussion – framing the problem (and if applicable its components) that we are trying to solve

Documentation of the team discussion regarding possible solutions – a wide range of thoughts and formats

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Alternative Courts Working Group

Initial Hypothesis

- In certain legal cases (e.g. Drug abuse) an alternative pathway through the court system may be available
- Case workers typically track the information related to a case, pass it on to the DA and recommend the court path
- How can we inform and support the collection of information and preparation of recommendations?
- How can information securely be passed along the court path?

Additional Context

Notes from a conversation with a HHS Department

- Various agencies are involved, law enforcement, DA, Department of Corrections, Treatment providers, State Public defenders, Judges/Courts, Treatment Court coordinators, are all exchanging information today. Similarly, criminal complaints. There is a lot of admin work involved in requesting access, getting permission, obtaining it, etc.
- Alternative Courts are just one example of how these agencies work together in sharing information
- A case that may qualify for treatment courts, DA verifies eligibility, Treatment coordinator conducts assessment from many sources, sometimes across the country, obtain the treatment history, summary is presented to the team, team decides to accept that case or not, coordinators maintain the files in a secure record, any updates are obtained from coordinators, occasionally additional information comes in (e.g. new charges). If coordinators had access in real time to information (at least within the County) it would avoid false decisions
- Next step is sentencing based on the collected information. Getting the highest quality possible is key.
- Challenges: obtaining records. Majority of records are within County/State. Streamlining the process vs. waiting for many stakeholders and taking detours, can accelerate the process. Aspiration is to resolve 60-90 window. Reality is 90-120. People are typically in jail throughout this process, so there is a cost component as well and delay of the treatment program.

Alternative Courts – Research Sources

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Topic	Author	Source/Link	Comment
Effective justice strategies	Wisconsin Court system	https://www.wicourts.gov/courts/programs/altproblemsolving.htm	Introduction to the concept of Treatment Courts
Do Drug Courts Work? Findings From Drug Court Research	National Institute of Justice	https://www.nij.gov/topics/courts/drug-courts/pages/work.aspx	Brief article with key facts around impact based on long term study
How to make drug courts work	Washington Post Blog	https://www.washingtonpost.com/news/wonk/wp/2013/04/26/how-to-make-drug-courts-work/?utm_term=.82feee6f0734	Solid article with key facts and recommendations, not technology focused, but helps understand the problems that need to be solved
Artificial intelligence gets its day in court	George State University	https://phys.org/news/2018-03-artificial-intelligence-day-court.html	Article about the use of AI in sentencing
How artificial intelligence is transforming the criminal justice system	Stephanie Webber	https://www.thoughtworks.com/insights/blog/how-artificial-intelligence-transforming-criminal-justice-system	Article about the general use of AI in the court system
How Blockchain Technology Is Transforming the Legal Industry	Bloomberg Law	https://bnanews.bna.com/daily-labor-report/how-blockchain-technology-is-transforming-the-legal-industry	Overview of various general use cases for Blockchain in the court system

Alternative Courts – Research Summary

A 2x2 matrix of applying technology

- The first dimension of our matrix is the type of technology. Both AI and Blockchain have credible applications in the criminal justice system, see use cases on prior page
- The second dimension is the aspect of justice: optimizing the process (coordination among many stakeholders throughout the court process) vs. impacting the sentencing. There is significant push back from ethical and other perspectives on the use in sentencing.

Identifying the right ecosystem for a solution is key

- The Treatment Court process happens largely at the County level, but may quickly involve agencies outside of the county, e.g. at the State level. Various agencies of law enforcement are involved, so creating a solution that only applies “within the county ecosystem” may not work out
- How can a larger ecosystem work towards a solution, what role can a county play in advancing the thinking

Reducing complexity is a key theme

- The treatment court workers (from the County perspective they are at the center of the process) have to navigate information from many sources, often large amounts in cases with a long history
- What knowledge extraction, organization, prioritization tools (e.g. natural language capabilities), what expert systems, what sharing mechanisms could be leveraged to reduce the administrative burden

Alternative Courts - Background

Wisconsin has alternative courts for certain non-violent offenses where alternative sentences, treatment or jail programming may provide a better long-term outcome for the offender and society in general, may reduce costly prison populations and provide recovery for victims or families involved.

Examples

- Drugs (including heroin/opioid courts)
- Alcohol / Operating while intoxicated (OWI) courts
- Truancy
- Children in need of protective services (CHIPS)
- Mental Health
- Family Court
- Misdemeanor diversion
- Veterans

Most of these courts require coordination and cooperation from multiple stakeholders both internal and external to the court systems including: law enforcement, court / prosecutors, defense attorneys, medical, psychological professionals, social service organizations, victims and impacted families, parole officers, insurance companies, employers and others.

Alternative Court Case Example (1/2)

Event	Parties involved
Crime is committed	<ul style="list-style-type: none"> • Criminal • Victim
An arrest is made and criminal is processed ending up with referral to DA/prosecuting attorney	<ul style="list-style-type: none"> • Police / sheriff • Booking processors • District Attorney
Charges are made; case is assigned to a court for initial hearings	<ul style="list-style-type: none"> • District Attorney • Court administrator • Judge(s) • Defense attorney
Review of case by DA to determine whether it is a candidate for an alternative court (non-violent, fits profile for each specific alt-court type)	<ul style="list-style-type: none"> • District Attorney • Defense Attorney
Assessment and review of past records	<ul style="list-style-type: none"> • Court Coordinator • Alcohol and other drug abuse (AODA) treatment records • Mental health records • Arrest history and prior court records (county, state, federal databases) • Private medical, bank or other relevant personal records • Medical, psychological and mental health professionals • Social service agencies (Child protective services, homeless agencies, veterans agencies, etc.)

Alternative Court Case Example (2/2)

Event	Parties involved
<p>Court Coordinator creates recommendation using established guidelines which is agreed upon by prosecution and defense, and then confirmed by the court</p>	<ul style="list-style-type: none"> • Court Coordinator • Criminal • Victim • District Attorney • Court administrator • Judge(s) • Defense attorney
<p>Case monitoring and programming is initiated and reported as required by court</p>	<ul style="list-style-type: none"> • Social worker or case worker • Treatment or program providers <ul style="list-style-type: none"> a. Medical, psychological and mental health professionals b. Social service agencies (Child protective services, homeless agencies, veterans agencies, etc.) • Criminal • Victim • District Attorney • Court administrator • Defense attorney • Judge(s) • Court Coordinator

Issues with Current System

The group brainstormed a number of problems currently being experienced which make alternative courts difficult to operate, drive costs up and reduce potential benefits:

- States have multiple courts on multiple levels and in multiple jurisdictions using multiple judges which creates consistency and data sharing issues.
- Each alternative court has their own stakeholders and eco-systems, for example:
 - Drug courts – psychologists, PhD/MD's
 - Family Courts – family counselors, guardians, family members, etc.
- Jurisdictional issues across counties, states
- Multiple info sources from multiple people (i.e. case workers, social workers, criminal records, court records, medical records, etc.)
 - Ability to obtain records and speed of collecting the data creates significantly delays in the process.
 - Missing critical data introduces additional delays and re-processing
- Data systems are often siloed and do not talk to each other
 - Many systems do not have APIs or standardized data
- HIPAA and confidentiality rules impede access to data

Issues with Current System

Continued from prior page

- HIPAA and confidentiality rules impede access to data
- Buy-in on alternative courts as a whole is problematic; some question the effectiveness / cost effectiveness of alternative courts, particularly over-time as case data is not always tracked.
 - Viewed as “soft on crime” so some elected judges fight it
 - DA’s have power to determine who can go to an alternative court and could make it a discriminatory or political decision.
- Demonstrating outcomes is difficult:
 - Tracking mechanisms are not consistent or reported
 - Data is gathered from disparate sources creating problems in interpreting or correlating data
 - The impact of the alternative courts includes costs avoided which are hard to quantify.
 - Goal of avoiding “recidivisms” (repeat offenses) is not easy to track.

Alternative Courts - Problem Definition

How can enhanced technology and secure and private access to data improve the effectiveness and outcomes of Alternative Courts

How do we improve private and public data access for stakeholders to improve outcomes?

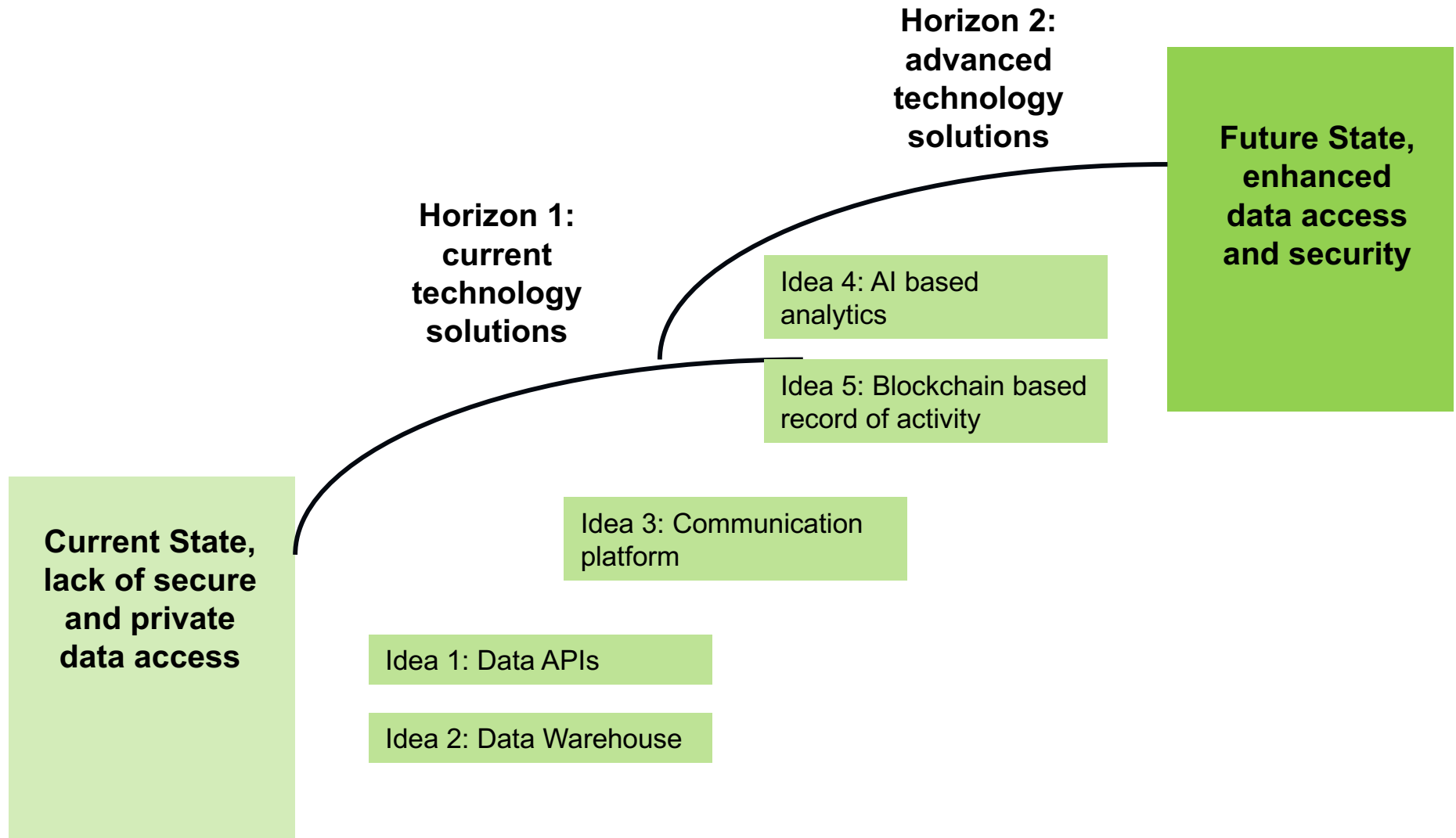
How do we integrate all necessary elements of case data from various sources?

How do we leverage pertinent case data from multiple sources to provide contextual insights regarding cases and dependents to inform decisions and improve outcomes?

Lack of ability to provide data-informed contextual insights to inform decisions and improve outcomes – How do we incentivize the positive evolution of data sharing policies across agencies and Jurisdictions to support data access, integration and insight?

How do we leverage historical & current case experience and documented outcomes to inform recommendations?

Overview of Solution Horizons



Idea 1 Profile: Data API Capability

What is the basic idea?

- Improve the connectivity between data sources and the ability to exchange/consolidate data

How is technology being leveraged?

- Use existing APIs (i.e FHIR used for Apple Digital Health record) – blockchain enabled (trusted access to data)
- Push to have more State level data available via APIs
- Case system is integrator of the data received from disparate systems

What benefits are derived?

- Easier access to key data access
- (health records)
- Medical records authorized by human clients
- Easier access to relevant decision data - less effort/cost and more quickly

What's next?

- APIs are a common technology tool, the key is to build a consensus among the stakeholders which architecture to utilize and then to implement the APIs across the various systems
- Complexity of stakeholder constellations makes this more difficult

***Starting point only,
needs further work***

Idea 2 Profile: Data Warehouse

What is the basic idea?

- Create (recreate) a data warehouse for the case data to consistently feed information into downstream systems for decision making, viewing, etc.
- Create ability to analyze the data in the warehouse

How is technology being leveraged?

- Central repository for data to be analyzed and reported; many technology and design options are available

What benefits are derived?

- Central integration and data management
- Easier reporting and analytics

What's next?

- Warehouse technology is well established, but without thoughtful design cost can exceed the derived benefit
- Distribution of cost may be key issue in under-funded stakeholder coalition
- Need to create a very clear cost benefit analysis (lack of fundamental buy-in into the model of Alt Courts could be an obstacle)

*Starting point only,
needs further work*

Idea 3 Profile: Communication Platform

What is the basic idea?

- Improve real time communication and visibility to all stakeholders (vs. individual/partial exchanges via email)

How is technology being leveraged?

- Shared access messaging app (e.g., Slack) which allows group, small group, and private communications as well as attaching of documents, AI based search functionality

What benefits are derived?

- Coordinated communications
- Easy interface to communicate
- Digital record

What's next?

- Multitude of messaging applications are available
- Features and security requirements to be evaluated
- Platforms are used by many corporations and organizations, so this is not an experiment, but a matter of changing communication patterns and preferences (one more place to check)

*Starting point only,
needs further work*

Idea 4 Profile: AI based Analytics

What is the basic idea?

- If data is being aggregated in the warehouse (or even if it is stored in a different environment to date), an analysis of case patterns and outcomes can yield important insight into intervention effectiveness
- Complex patterns can be detected with AI based solution

How is technology being leveraged?

- Analytics models created and trained on historical data or used to analyze amassed stored data (National Center for Courts is looking into this)
- Predictive modeling based on historical case data. Initial recommendations provided to court case coordinator

What benefits are derived?

- More consistent recommendations with thoroughly documented logic and reference points
- More efficient processing of recommendations

What's next?

- AI is beginning to make its way into the world of courts
- Quality of the model is contingent on the training data set that is available (does the warehouse need to come first?)

*Starting point only,
needs further work*

Idea 5 Profile: Blockchain based Record

What is the basic idea?

- Cases which involve a high data security level and require a seamless chain of evidence could be documented in an immutable format
- Secure Stakeholder access to current records is important

How is technology being leveraged?

- Blockchain app for police arrest and related court actions creates an immutable record of court activity from initiation to resolution / settlement
- Encrypted with permissions system for access (permissions are revocable)

What benefits are derived?

- Trust in police and court records.
- Transparency of activity

What's next?

- x

*Starting point only,
needs further work*

The Digital County Journey

- A Recap of our Journey
- Artificial Intelligence Use Cases
- Internet of Things Use Cases
- Blockchain Use Cases
 - Alternative Courts
- **Access to Public Information**
- Secure Information Profile
- Evidence Tracking through the Court Process
- Child Protective Services



Access to Public Information Working Group

Initial Hypothesis

- Requests for birth certificates, marriage licenses, titles, property deeds, etc. comprise a meaningful portion of in-person interactions
- How can we securely identify an individual making a request for an information document
- How can we minimize or eliminate the need for human interaction to obtain this information
- What value added information can we collect during the interaction and how can we use this information to direct the requestors to related/ancillary/likely additional services

Access to Public Info – Research Sources

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Topic	Author	Source/Link	Comment
Open ID connect	“The Economist”	https://www.economist.com/international/2014/06/28/estonia-takes-the-plunge	Digital ID allows the possibility to Prove who you are so you can bypass regular methods to receive important legal documents. Ex: people can file taxes from their smartphones
Transforming government through digitization	McKinsey	https://www.mckinsey.com/industries/public-sector/our-insights/transforming-government-through-digitization	Broad overview article, but under the services section spells out five key opportunities for governments to interact with “customers”
Identity blockchain	Tey Rjula	https://www.friss.com/blog/identity-blockchain-the-solution-to-the-weakest-link-our-system/	Solution which stores important identity documents digitally in perpetuity, eliminating the need for future requests
Illinois launches blockchain pilot to digitize birth certificates	Coindesk, Michael del Castillo	https://www.coindesk.com/illinois-launches-blockchain-pilot-digitize-birth-certificates/	Case study on digitization of vital records
The future of government customer service: 4 trends to watch	Sharon McCoy	https://www.govloop.com/community/blog/the-future-of-government-customer-service-4-trends-to-watch/	Good overview article on how government needs to rethink its approach to serving customers; you can find a lot more info on those keywords

Access to Public Info – Research Summary

Challenge number one: establishing identity

- We have a separate use case that deals solely with secure information profile and the idea of a verifiable identity. If Counties can become comfortable accepting a digital format of identify verification, then the entire process can move online.
- Several platforms and solutions (e.g. biometrics, self sovereign identity) are available to achieve this goal

The next step is an online information/ resource portal

- Many industries have moved to an online/mobile first paradigm (banking, retail) based on reliable identification and reliable delivery. Could the front end (getting information, making a request) be entirely digitized?
- Since many of the requested documents are of high personal value and have high fraud exposure risk, the question might be whether the physical copy of these documents can be cut out entirely, so that the not only the request, but also the fulfillment and storage can become digital (e.g. in a secure blockchain environment, see self sovereign identity)

Embracing a cross-service mentality

- Many of the current requests are fulfilled by “clerks”. A specific request is met. What do we know about the likely context of that request? What is the “next likely service”? How can we utilize predictive analytics to create a better service experience for our customers, pointing them to additional county based resources and/or even private sector resources related to their specific issue

Access to Public Info. - Problem Definition

How can we create a better customer service experience for the public while reducing administrative effort and cost in fulfilling access to information requests (e.g. vital records, deeds, registrations, etc.)

How can we securely identify an individual making a request for an information document

How can we minimize or eliminate the need for human interaction to obtain this information

What value added information can we collect during the interaction and how can we use this information to direct the requestors to related/ancillary/likely additional services

Solutions in Four Categories

**Improve Customer
Service Experience**

Address Silos

**Establish Single
View of Customer**

**Address
Organizational
Change Challenges**

User Experience Perspective - Issues

- Users have to fill out some of the same information multiple times
 - Lots of paper-based input. Often basic identity is entered submitted multiple times (e.g. name, address, birthdate)
- Users have a hard time knowing who to talk w/ in order to get info or transact
 - Typically they arrive in person or call and get redirected multiple times depending upon the work flow
- Users have to make multiple stops in order to complete a workflow (e.g. getting married)
 - Marriage certificate, birth certificate, change maiden name with Social Security, change name with DMV
 - Multiple fees may be associated with each request or transaction
- Users have to arrive during posted business hours in order to get info or transact with the county. Office hours are inconvenient and require time off of work. Sometimes this means a lengthy process to complete something that could take less time/effort.
- There are various fees that are collected at various agencies
 - These fees, across multiple agencies, is also a disincentive for information sharing across agencies. Each agent is motivated to collect fees that benefit their own budget.
- There are differences in the general needs of the experience
 - Baby boomers seek to talk with a person
 - Gen X/Millennials expect to have an on demand mobile experience
- Some workflows need various levels of approvals that result in delays in processes and users do not know status (e.g. building permit, permits in general)

Improved Customer Experience - Ideas

- 24/7 online access
 - Ability to request information and get status of requests in workflow
 - Notifications (e.g. email, text)
- Chabot in order to help customer navigate to the right agent
 - Much of the information is already online but difficult to navigate
- Self-service identity management to reduce time entering same information on multiple forms
- Complete view of customer for agents (requires better integrated systems and better routing/visibility across systems)
- 'Playbooks' to help agents anticipate user needs or help educate users on process or services available. There is ability to anticipate a user's need though didn't see a clear opportunity of AI here

Address Silos - Issues

- Some data/processes are at tiered layers
 - Federal, State, County, Municipality, Private
 - Each entity with motivating factors to not share their data due to statutory fees that may be associated with the services they provide
- There are some regulatory rules that prevent sharing of some data or interfacing systems directly
 - e.g. jail inmate info, inmate health records
 - Some information needs to be redacted (e.g. victims of domestic violence and don't want to reveal their name on a property deed)
 - Some rules/laws? Prohibit direct interfacing of systems via an api (application program interface); Instead manual efforts are used of export/import.
- Conflicting standards, laws and ordinances exist at the local, state, and fed level (e.g. building codes)
 - A builder may get approval at one level but it may be in conflict at another level
- Various levels of consent are needed to share data
 - By individual, by agency
- Duplicated data may be in multiple data schemas making it difficult to integrate and ensure data integrity
 - No common base set of data (e.g. user identity)

Address Silos - Ideas

- A ledger for Access Control List (ACL) would be useful to control who has access to what data.
 - Data may still be federated across multiple systems but would release data with respect to the ACL
 - Additional integration points (where possible) will need to be built to fulfill the access to data based on the ACL. Some regulations prohibit integration/sharing of data.
- An incentive system (possibly token economy) may be useful in motivating the sharing of data. It is known that there is some disincentive in sharing information due to statutory fees gained across agencies.

Single View of Customer - Issues

- Not every agent has access to enough information in order to serve a user's need. This makes them direct the user to another agency.
- This makes it difficult to provide users with information like status of a permit.
- Since basic identity information is spread across multiple siloed systems, there is duplication and potential for data integrity problems (e.g. maiden names changed, old home address, multiple user IDs for systems)

Single View of Customer - Ideas

- Need to demonstrate value of a wholistic view of a customer in order for agents to help customers
 - Technological challenge has several components: the ability to retrieve, cleanse, and aggregate the customer information from various sources, the resolution of data duplication or contradiction (e.g. different addresses) and the presentation of the customer view to the agent
-
- Provide better integrated solutions, potential using blockchain as a ledger for access control in an ecosystem of federated and sometimes integrated systems.

Organizational Change - Issues

- There is a lot of inertia that keeps status quo
 - Efficiency gain is usually viewed as an opportunity to cut budget/heads instead of retraining and repurposing staff for higher value more engaging work.
- There is a lot of resistance to change
 - Mostly in the name of job security
 - Sometimes the ROI is not clear
- Internally, county agents don't have enough information to help them track process or get a complete view of a customer need. This results in cumbersome and manual effort to get data or direct the user to another agency.

Organizational Change - Ideas

- Break the inertia to keep status quo by removing fear
 - Utilize efficiency gains for retooling and repurposing of staff rather than headcount reduction and cost savings (everyone has a place in the boat)
- Build a consortium that will champion change
 - This may be a local/regional coalition of players or across County boundaries, need to work with the willing to demonstrate success, others will follow
- Need to craft simple and intuitive success metrics
- Leadership needs to demonstrate enthusiasm for change, get buy-in at staff level, establish vision
- Must share success stories in order to get buy-in. There have been examples of consolidating systems and elevating to a more effective tier of government (e.g. Issuances)

The Digital County Journey

- A Recap of our Journey
- Artificial Intelligence Use Cases
- Internet of Things Use Cases
- Blockchain Use Cases
 - Alternative Courts
 - Access to Public Information
- **Secure Information Profile**
 - Evidence Tracking through the Court Process
 - Child Protective Services



Secure Information Profile Working Group

Initial Hypothesis

- An individual may interact with various services of the County over time. Technological and legal barriers (e.g. HIPPA) prevent the aggregation and sharing of collected information between the agencies (in many cases)
- The individual currently does not have an opportunity to securely obtain and store, and decide to share the relevant information with various agencies
- How could we create a secure online ID for County service users that collects information in various categories
- How can this information be governed to allow the individual to make informed decisions on sharing information
- How can this information be utilized to inform service recommendations to the individual (short term and long term prediction)

Secure Information Profile – Research Sources

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Topic	Author	Source/Link	Comment
IdentityTech and the role of identity in economic, political and social transactions	Alastair Berg, RMIT Blockchain Innovation Hub	https://medium.com/cryptoeconomics-australia/identitytech-and-the-role-of-identity-in-economic-political-and-social-transactions-a270c3b1f02f	Describes the concept of self sovereign identity and various use cases
Self Sovereign Identity— a guide to privacy for your digital identity with Blockchain	Alex Preukschat	https://medium.com/@AlexPreukschat/self-sovereign-identity-a-guide-to-privacy-for-your-digital-identity-5b9e95677778	Compact overview of digital identify models and various use cases
Brazil's Ministry of Planning Is Testing Blockchain Identity Tech	Coindesk.com	https://www.coindesk.com/brazil-ministry-planning-testing-blockchain-identity-tech/	Government use case from Brazil
How Blockchain is used by Governments as a form of National Identity	Paul Bryzek	https://medium.com/@bryzek/how-blockchain-is-used-by-governments-as-a-form-of-national-identity-e24a4eeefb7d8	Various use cases in Government (identify focused)

Secure Information Profile – Research Sources

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The following sources are describing comparable uses in Healthcare

Topic	Author	Source/Link	Comment
“MedRec” prototype for electronic health records and medical research data	Ariel Ekblaw; Asaph Azaria; John D. Halamka, MD; Andrew Lippman	https://pdfs.semanticscholar.org/56e6/5b469cad2f3ebd560b3a10e7346780f4ab0a.pdf	MedRec authentication log governs medical record access while providing patients with comprehensive record review, care auditability and data sharing
Medicalchain-blockchain technology to solve the problem of health data exchange	n/a	https://medicalchain.com/Medicalchain-Whitepaper-EN.pdf	Use case originally found on another site (https://medium.com/@Cryptostory/blockchain-in-healthcare-use-cases-dd683df5065b)
A Blockchain-Based Approach to Health Information Exchange Networks	Kevin Peterson, Rammohan Deeduvanu, Pradip Kanjamala, and Kelly Boles	https://www.healthit.gov/sites/default/files/12-55-blockchain-based-approach-final.pdf	An approach to effectively and securely share healthcare information within a data sharing network.

Secure Info. Profile – Research Summary

The vision of a user owned secure digital identity is becoming a reality

We need to discuss the relevant “ecosystem” for a solution

Several technology aspects need to be addressed

- The field of self-sovereign identity is surging fueled by blockchain and biometric identification technologies. The principal concept is that the individual should own all parts of their identity, manage permissions to access the information. The information can be utilized to reduce crime/fraud, reduce complexity in verification/validation situations (e.g. job applications, bank loans) and facilitate better collection/sharing of data between various providers (e.g. medical records sharing)
- At the highest level, a global/universal solution is available to every person. The challenge is the practicality and buy-in to this ecosystem. At the next level down national solutions are being created (see use cases), primarily focused on government interactions. In the U.S. a state level solution could be conceivable
- Ecosystems can also reach down into type of data (e.g. medical records only). The key question would be what the minimal viable scale for such an effort is. Single county level is likely not effective due to the high flux of individuals in and out of the ecosystem.
- Security: how do we ensure the highest level of system security overall (my “life” literally depends on it) and how do we ensure the highest level of authorized access by the actual owner/user (e.g. multi-biometric)
- Intake, categorization and exchange: with a plethora of potential data categories, how do we establish a standardized or flexible/user directed system of organizing the information, how can a user navigate info and find it across categories. How can users effectively manage permissions.

Secure Information Profile - Problem Definition

What role can Counties play in creating

- **Trust based**
- **Secure**
- **Efficient**
- **Value added**

Information exchanges between constituents and the Counties/State?

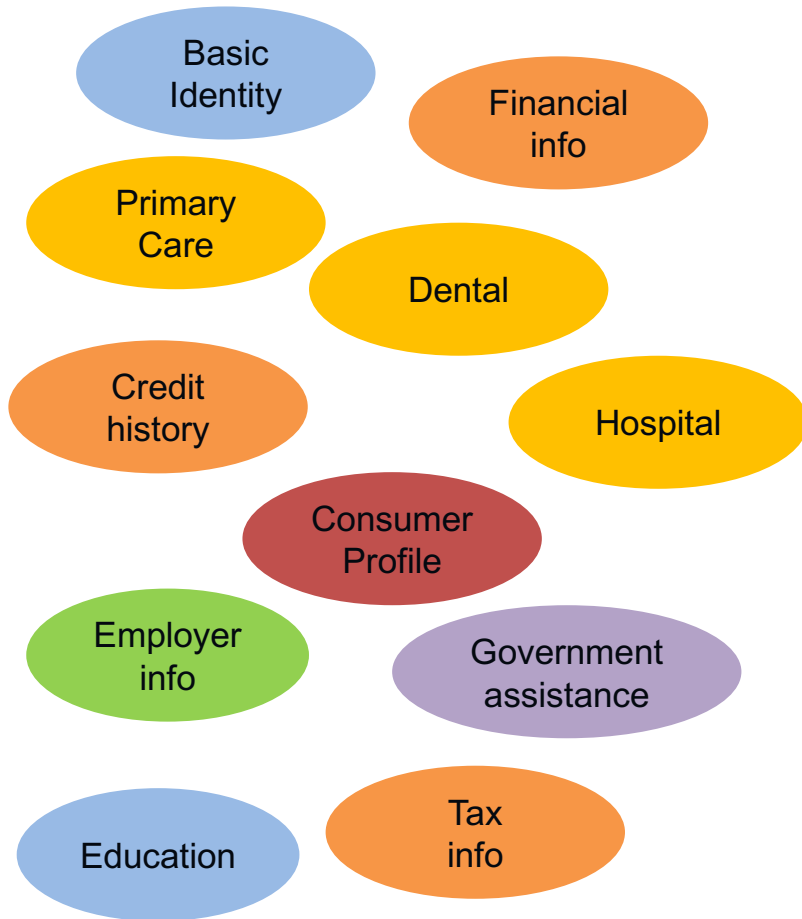
How do individuals and Counties benefit from enhanced information exchange, what are potential downsides?

Who should own/govern the collection, aggregation, analysis and distribution of information?

Given constraints of Trust (e.g., between citizens and the Government) and a limited willingness to cede control of data (e.g., individual agencies who derive an advantage from data ownership), what steps can Counties take to optimize the collection, sharing and usage of currently available data?

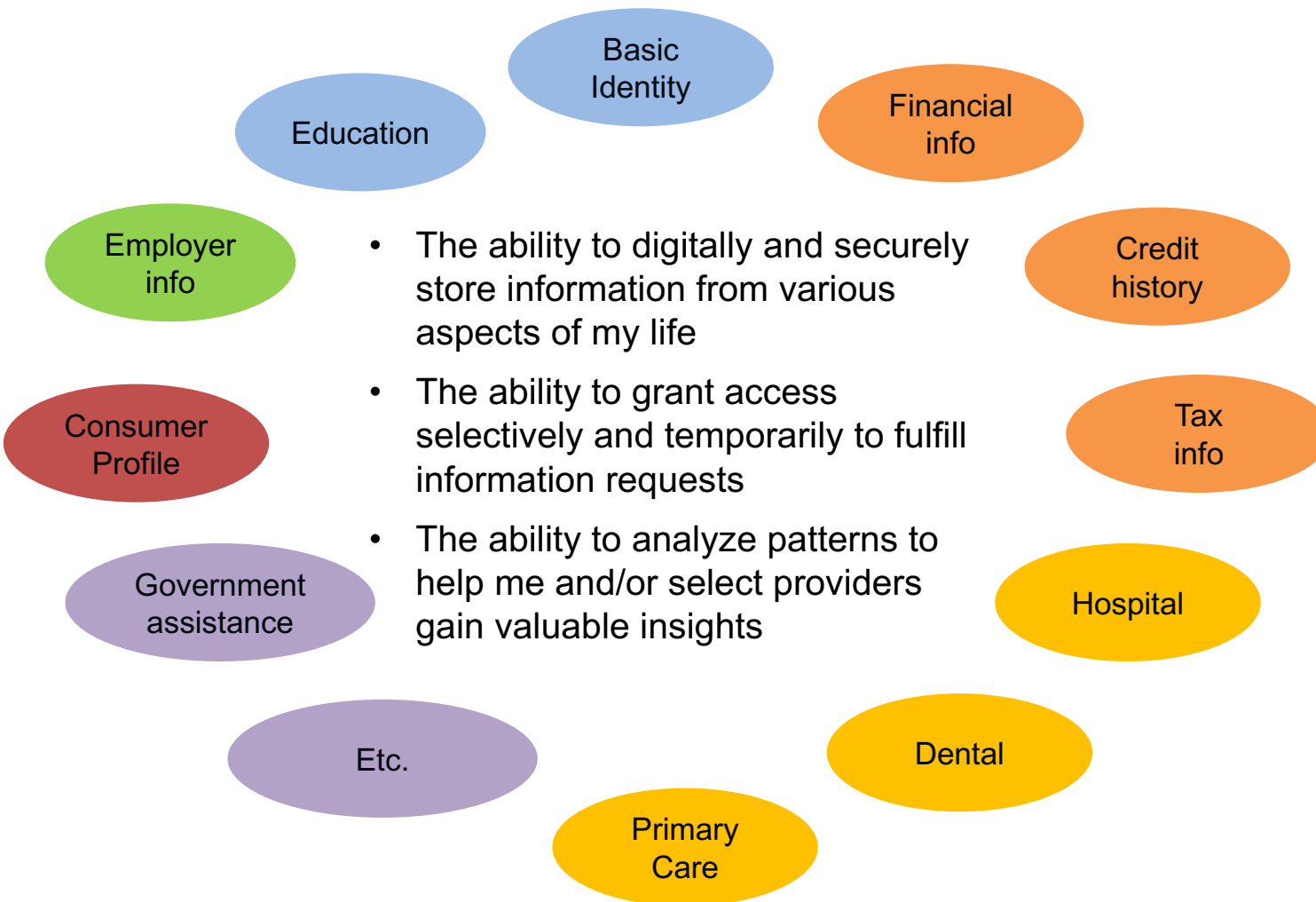
How can we prevent isolated innovation and instead foster collaboration between Counties, State Agencies, and Identity Through Leaders?

Understanding the Problem in Principle



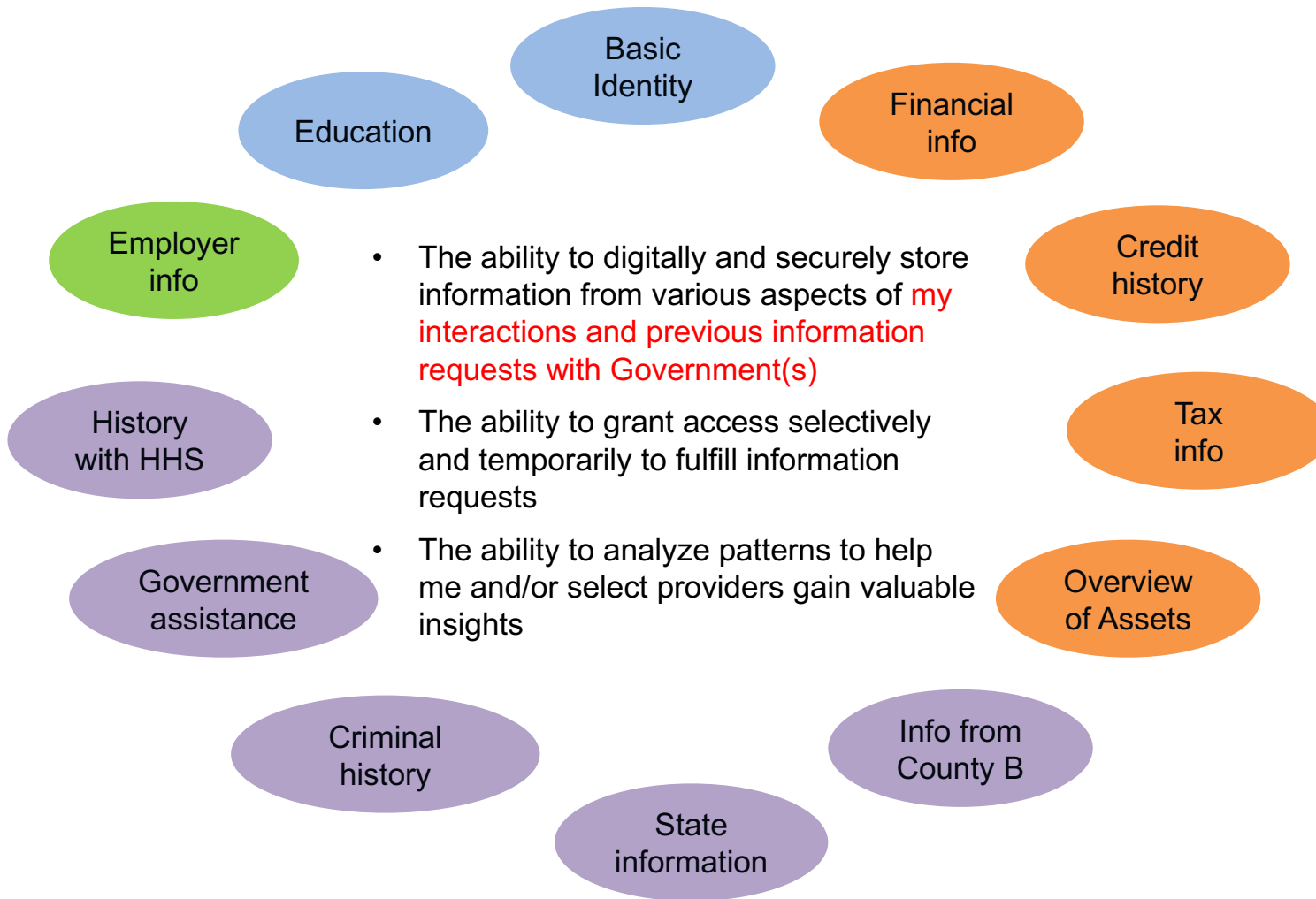
- Today, the information about “Me” is highly fragmented and stored in many places
- In many cases, I may not even be aware or not have access to that information unless I make a specific effort to obtain it
- Whenever information about me is requested (e.g. dealing with a new Health provider, with Government, with Law Enforcement, with a Financial Institution) many elements of my personal information are requested and I have to “recreate me” or a portion of me by filling out forms (sometimes having to go back to painfully collect the information)
- Some data aggregation services exist, such as a digital wallet, financial account aggregation, or health information exchanges, but there has not been a vision of a multi-category digital profile concept

The Concept of a Digital Profile – Big Picture



- What may sound like an impossible vision (or a scary one if you consider security breaches and big brother concerns) is starting to become a technological reality
- Efforts such as self-sovereign identity are working on the various technology solutions that have to come together to make this vision work
- But this problem is too big for us...

The Concept of a County Digital Profile



- We don't have to try to change the way the world works, but could we change the way information sharing between the constituents and various State and County agencies works?
- Many of the underlying categories still apply (info about the constituent and history of interactions)
- The technology platform may be similar

**Starting point only,
needs further work**

A More Modest Vision

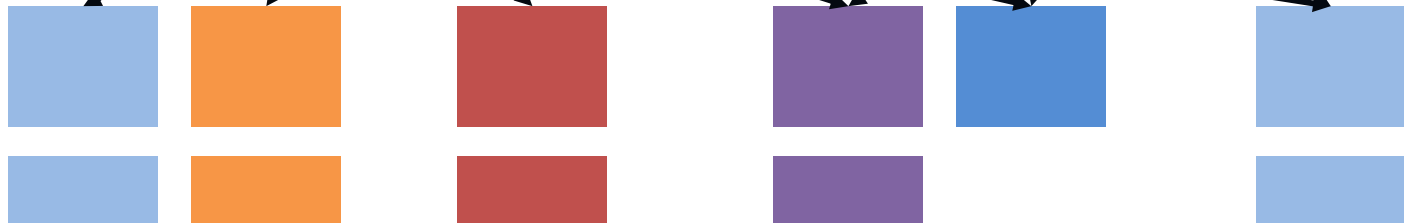
A digital identity is created with basic personal information, including historical info for reference

Certain data sources (e.g. credit report, law enforcement) are pulled as needed

County ID with select data set

Public data sources (currently available)

County departments draw on common data, store unique data separately



Can share data with permission

Can share data

Departments comply with data sharing rules (e.g. HIPPA), and collaborate where advised to achieve key benefits

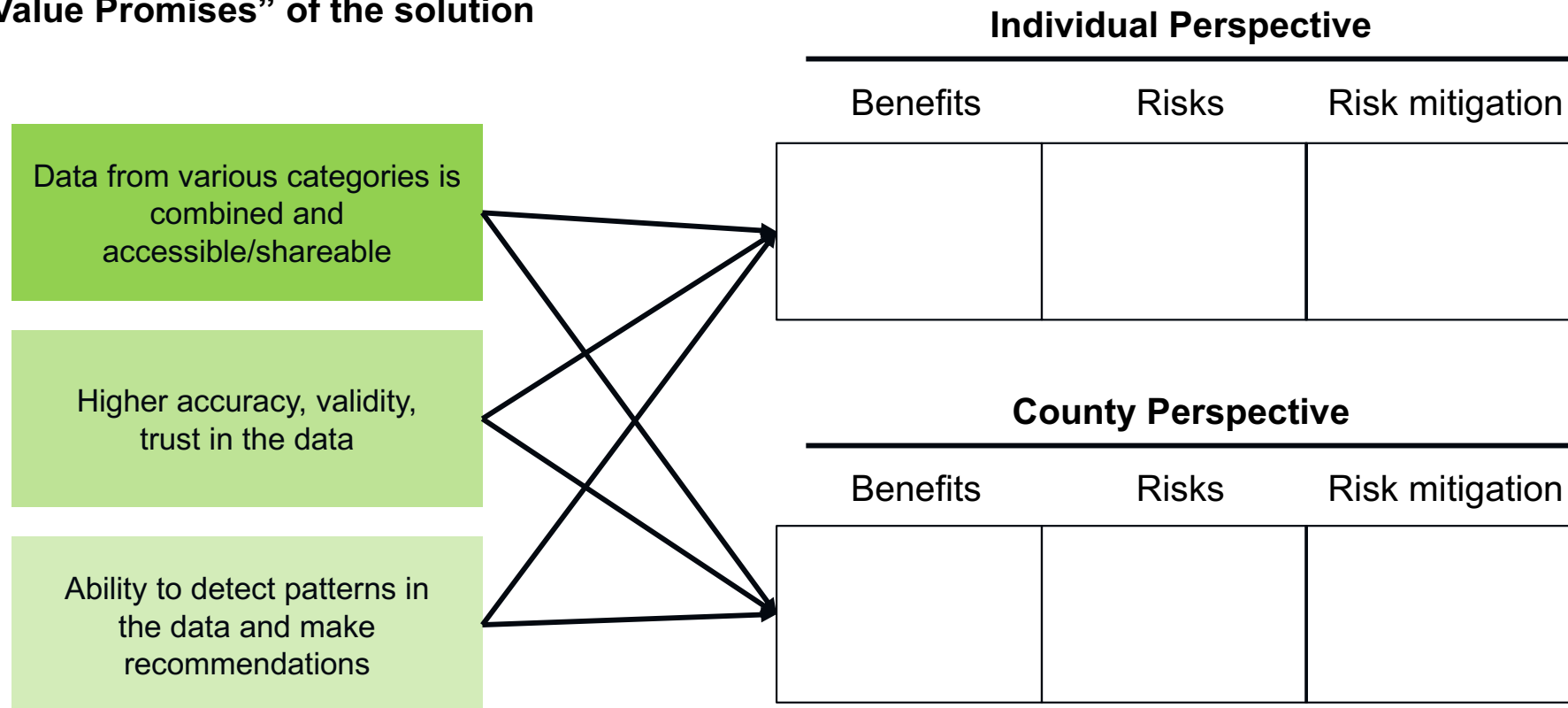
The List of Potential Concerns is Long

- First of all, who is supposed to own this data profile?
 - If the constituent owns it, how do we make sure they keep it safe and that they even have the general capacity and ability to collect and manage the information, who would do this for minors, the elderly, the incarcerated, the disabled, how do we manage consent?
 - If government owns it, how we maintain privacy of the information vs. public record and retention rules (e.g., what are the boundaries of Freedom of Information Act requests regarding such information)?
 - If a third party owns that, how do we ensure they act on behalf of the constituents and are not abusing the analytical power to commercialize the information? Can we imagine a “trusted custodian”?
 - How do we motivate sharing of data from all of the underlying data sources, how do we explain the benefits to individuals (what if nobody want this)?
- Next, how could we keep it secure?
 - We are already petrified about our data security in light of all the data breaches that occur. If this treasure trove of data were to be compromised, identity theft would take on a new dimension
- How would we organize the data and move data in and out and validate it?
 - What are the different categories of data that are needed, what if they differ too much across individuals? How do we assign data to different categories without misplacing or mislabeling it?
 - What part of the data is public, private, protected, how do we organize, segment, flag data?
 - Interfacing with other digital (or non-digital) sources could be a logistical and technological nightmare, who will define standards?
 - How do we make sure the data we have is the correct one (e.g. conflicting info from various sources about address, employment, financial status, etc.), how do we prevent overwrite of good data?
- We could decide at this point, that this is a problem that is far too complex to tackle and in the ordinary course of business this is what we would conclude. Our symposium however is an opportunity to reimagine, even if the vision of what we can see may not be imminent. So let’s start with risks and benefits.

Benefits and Risk Assessment - Overview

We used some of our brainstorming time to work through some of the fundamental considerations of the risk and benefits from both the individual and the County perspective. We did so separately for each of the three value promises of the solution. This is again meant to be a starting point, not a completed and conclusive assessment.

“Value Promises” of the solution



**Starting point only,
needs further work**

Benefits and Risk Assessment (1/3)

Feature of the County Digital Profile:

Data from various categories is combined and accessible/shareable

Individual Perspective

Benefits	Risks	Risk mitigation
<ul style="list-style-type: none"> • Real time data, fewer errors • Single point of contact, easy to see own history • No need to repeat info • Potentially lower fees • Ease of sharing data, knowing what data was shared when and with whom 	<ol style="list-style-type: none"> 1. Security breach: access to a wide range of data 2. Uncertainty on how this data is used and shared 3. Public visibility (e.g. FOIA) 	<ol style="list-style-type: none"> 1. Data segregation and multiple layers of security (a vault of safes); limited permissions, access only to portions of the data 2. Disclosures and consent, alerts on data usage 3. Ownership not by Counties; validation proxies/flags, rather than full data sharing

County Perspective

<ul style="list-style-type: none"> • Less duplication, easier/faster to find information (time saver) • Leverage to provide additional or suspend services • Collect Federal Aid more reliably due to better information 	<ol style="list-style-type: none"> 1. Higher (or different) audit burden 	<ol style="list-style-type: none"> 1. There should be fewer audits as there are fewer data sources; need to follow the rules diligently
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Benefits and Risk Assessment (2/3)

Feature of the County Digital Profile:

Higher accuracy, validity, trust in the data

Individual Perspective

Benefits	Risks	Risk mitigation
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<ul style="list-style-type: none"> Ability to self correct information and see history of changes Transparency on what has been collected (if data is fully visible to the individual) 	<ol style="list-style-type: none"> 1. If data is not being managed by the individual, bad data will follow the individual around 2. Perception of “big brother”, will make it harder to provide false information (for small group who does so to obtain unwarranted benefits) 	<ol style="list-style-type: none"> 1. Periodic data review has to be prompted, system has to indicate when the last review was performed (and certified by the individual)
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County Perspective

<ul style="list-style-type: none"> Less validation work Shift of the liability about data accuracy to the individual (if control is with the individual) 	<ol style="list-style-type: none"> 1. If the data is bad, every County department will be using bad data; exposure to deliberately bad data 2. Higher liability if false data is accepted 	<ol style="list-style-type: none"> 1. Need state of the art data validation mechanisms, including external data validation; time stamping and clear change log to govern data overrides 2. same
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Benefits and Risk Assessment (3/3)

Feature of the County Digital Profile:

Ability to detect patterns in data and make recommendations

Individual Perspective

Benefits	Risks	Risk mitigation
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<ul style="list-style-type: none"> Better service based on better understanding of needs and overall situation Higher awareness of available opportunities (if Counties make proactive recommendations) 	<ol style="list-style-type: none"> Unwarranted Marketing of profiling of the individual 	<ol style="list-style-type: none"> Control over the data has to be governed by the individual (or a trusted entity), no commercial access
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County Perspective

<ul style="list-style-type: none"> Close service gaps for constituents with identified needs, more proactive posture Support forecasting (financial) 	<ol style="list-style-type: none"> Unintentional profiling 	<ol style="list-style-type: none"> Enhanced controls, reviews, user permissions
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Ownership Options Evaluation

As pointed out in the prior section, a critical consideration is “who owns” this data profile, including the collection and governance of data, security, etc. We explored different options and assessed the Pros and Cons of each option.

	Pros	Cons
State	<ul style="list-style-type: none">• All 72 Counties have consistent data model, higher portability• Interface with Federal programs• Lower cost and higher security	<ul style="list-style-type: none">• Lack of Trust in Government• Seven State agencies, limited coordination, self interest to preserve control over data• Total cost of providing services goes up as eligibility is uncovered more consistently
County	<ul style="list-style-type: none">• Higher agility, experimentation• Could build a smaller, more precise solution	<ul style="list-style-type: none">• County boundaries may change• Many Counties don't have the ability/capacity• Higher complexity, divergence of solutions, data sharing more complex, security issues
Third Party	<ul style="list-style-type: none">• No FOIA issues• Less work/maintenance for the Counties	<ul style="list-style-type: none">• Profit motivator could lead to data abuse• Difficult to choose single provider, could lead to divergence, higher overall cost
Self Sovereign*	<ul style="list-style-type: none">• Autonomous governance of the data• Free• Should have a higher level of trust (not a central power)	<ul style="list-style-type: none">• Hard to explain to users, adoption issues• If users don't adopt one of the above solution needs to be created (duplication)• Limited ability to influence and govern• Unclear liability

* An emerging identity paradigm, see next page for more detail

What is Self Sovereign Identity

Outline of the emerging concept*

A digital, highly secure, trusted identity (potentially on a blockchain basis)

- It is portable (no need for a new drivers license when you move)
- It is not owned by any particular organization/government entity, but it is accepted/trusted by governments (based on validation processes)
- It can be configured to contain various aspects of personal data, provides data ownership and governance to the individual
- It allows the individual to identify themselves while choosing how much information to reveal (e.g. a verified certificate of financial standing vs. having to provide detailed financial information)

Use cases*

Government

- Serves as Identification and Voter ID
- Access to all Government Services (no separate applications)
- Identification of refugees (if internationally applied), even if documents are lost/destroyed

Other

- Make purchases without revealing full information (credentials based)
- Share medical information/history with providers
- Validation of educational credentials

What is a Realistic Path for Counties?

This topic may be “further out” than other use case we tackled. Hence, it may not receive much attention initially, but Counties can influence the conditions which ultimately lead to change. Here are a few thoughts by the group:

- Standardize data formats and communications within a County, between Counties, between Counties and State
- Counties without Borders initiative (joint operations to address funding challenges, create synergies) or formation of County Consortia (examples exist in WI)
- GIPAW (Governmental Information Processing Association of Wisconsin) is emerging as the Tech “Spokes-channel” for Counties, collaborate with WCA to gain leverage
- Consider creating a shared service organization with a special purpose

- Build a technology outlook into County Strategic Plans and IT Plans
- Utilize scenario planning to identify key capabilities, priority areas, and pilot use cases

The Digital County Journey

- A Recap of our Journey
- Artificial Intelligence Use Cases
- Internet of Things Use Cases
- Blockchain Use Cases
 - Alternative Courts
 - Access to Public Information
 - Secure Information Profile
 - **Evidence Tracking through the Court Process**
 - Child Protective Services



Evidence Tracking Working Group

Initial Hypothesis

- When evidence is collected by the Sheriff, it has to be documented and tracked as it is passed through potentially several stages of the Court system
- Partial solutions for evidence tracking exist, but no solution exists across the entire process
- How can we create a unique and non-corruptible identifier for a unique piece of evidence?
- How can the piece of evidence be tracked physically and virtually to determine its entire path as well as current location and responsibility for custody?
- How can we analyze information from the pathway tracking to optimize overall evidence management?

Evidence Tracking – Research Sources

Disclaimer: The sources listed here were collected in advance of the meeting to help facilitators prepare for the sessions. They may only reflect a small subsection of the pertinent literature on the subject and make no claim for completeness or accuracy. We are listing them here in the spirit of allowing those who want to immerse themselves deeper into the topic to have a starting point for doing so. We strongly encourage further efforts to identify additional sources and perspectives.

Topic	Author	Source/Link	Comment
Blockchain of evidence	Distributed Ledger Technology (DLT)	https://docs.google.com/document/d/1rGHNzrZsMSIDQgFSXVNrRuBYXdPIhfUFWZM3JGmjv0/edit#heading=h.esc4h2xm0icd https://mojdigital.blog.gov.uk/2017/11/02/increasing-trust-in-criminal-evidence-with-blockchains/	Digital media gets a “fingerprint” Transfers of evidence
Forensic-Chain	Auqib Hamid Lone, Roohie Naaz Mir	https://journal.scsa.ge/issues/2017/12/783	
CryptoSeal- An all-in-one, tamper-evident and blockchain-registered solution for packaging, physical asset tracking, and supply chain provenance.	“Chronicle Staff”	https://blog.chronicled.com/how-and-why-we-invented-the-cryptoseal-6577d8633a2 Links to the product website located in the article	tiny computer chip with cryptographic identity into a slim adhesive seal strip form factor to secure a package; records the identity of its registrant and packaging or asset metadata
How artificial intelligence is transforming the criminal justice system	Stephanie Webber	https://www.thoughtworks.com/insights/blog/how-artificial-intelligence-transforming-criminal-justice-system	Article about the general use of AI in the court system
How Blockchain Technology Is Transforming the Legal Industry	Bloomberg Law	https://bna.com/daily-labor-report/how-blockchain-technology-is-transforming-the-legal-industry	Overview of various general use cases for Blockchain in the court system

Evidence Tracking – Research Summary

Distinction between digital and physical evidence

- A blockchain solution on physical evidence creates a digital record of the location/movement/custodian, etc of that piece of evidence, but there are still other technologies (e.g. chips) required to reliably located and track the evidence.
- A digital piece of evidence may actually exist within the blockchain environment to prevent any type of alteration. Important to work out early on whether people are thinking about both categories or primarily physical evidence.

Identifying the right ecosystem for a solution is key

- The evidence tracking process happens at the County level, but may quickly involve agencies outside of the county, e.g. at the State level. Various agencies of law enforcement are involved and they have autonomy over technology decisions (typically led by elected officials, not in a clear line of command to the County)
- How can a larger ecosystem work towards a solution, what role can a county play in advancing the thinking. Who takes the lead in building and maintaining the solution in that ecosystem.

Learning from the past can yield key insights

- The majority of the discussion will likely focus on the “here and now” of evidence. How do we secure and transfer what we have right in front of us for the current cases. But there is an additional element that could be suitable for an AI application. The value of thousands of data files (once digitized) which show the path of evidence through the system. What patterns can we find, how many dead ends, losses, misplacements, inquiries, etc. can be avoided based on varying practices.

Evidence Tracking - Problem Definition

How can we leverage advanced technologies to optimize the management of evidence through the various stages of the court process?

How can we improve sharing of information (Evidence, Exhibits, Statements) among the various constituents?

What are technology solutions to optimize Evidence storage, retention, and purging?

How can we create higher efficiency in time consuming (often manual) processes (e.g., taking statements, video analysis, redaction)?

Improved Sharing of Information

Key issues today

- Information completeness (Hard to tell if missing information or not)
- Information dissemination integrity (Making sure everyone has received all the information and is seeing the same thing)
- Different data formats (Hard to share audio/video, use physical CDs, hard drives, etc.)
- Audit trail (Hard to maintain and view the audit trail for evidence storage, retention, and access)
- Different Record Management Systems (RMS) - currently 20 different systems
- Difficulty handling open records requests
- No single version of the truth (many potentially different copies created)

Future vision

- Ideally a statewide central cloud system, but that is likely impractical/cost prohibited
- Instead create a central cloud-based viewing interface system that can view the following:
 - Various RMS systems across the state
 - Digital asset management (DAM) system to handle the various digital storage formats (they need this as well)
- Work towards standard data protocols
- Blockchain system overlays all of it for data integrity/trackability

Evidence Storage, Retention and Purging

Key issues today

- Evidence Department owns all evidence, but needs triggers from other entities (DA, courts) to know what to purge
- Unclear and outdated rules/statutes
- Inconsistent purging processes across entities/systems
- Challenges with proof of disposal
- Data security and validity (how prove the integrity)
- Storage formats (cars, file formats, cold chain, physical versus digital, etc.)

Future vision

- Create a trigger based workflow system to manage the retention/disposal process
- Use blockchain for proof of disposal
- Automate purging where possible
- Send out notifications to see if anyone disagrees
- Need consistent statewide retention standards

Create Process Efficiencies

Key issues today

- Redaction - Difficult and time-consuming to redact information from videos and data (minors, PII, medical records, etc.)
- Taking statements - Currently a variety of written methods are used
- Video Analysis - How deal with the deluge of video to be analyzed

Future vision

- Redaction - Use an AI system that learns over time to automate redaction
- Taking Statements - Utilize audio recording, body cams, and voice-to-text to transcribe
- Video Analysis - First pass AI-based video search ("white car between 2am and 8am"), automatic video tagging, AI video enhancement algorithms

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- **Child Protective Services**



Child Protective Services Working Group

Initial Hypothesis

- Child Protective Services is intended to protect children from abuse and neglect. Referrals are screened through legal criteria based on risk assessments.
- Assessments involve a lot of criteria and a very high complexity of decision trees/logics
- How can we ensure the highest level of confidentiality of the individual case while (if warranted and allowed) share information about the case with other service providers
- How can we support the information gathering and decision process
- How can we validate recommendations and identify potential decision risks

Additional Context (1/3)

Notes from a conversation with a HHS Department

How does Child Protective Services becoming involved

- Articulation of a concern or evidence of something occurring is typically the starting point, a referral to Child Protective Service is made, small percentage is in person, by phone, by fax, could be anonymous, non mandated vs. mandated (defined in statute). Indicators of maltreatment are required; there is typically a glimmer of truth, but there are also fake referrals, not usually bald faced lies, but child custody disputes between parents
- System tracks historical data, but has no access to other agency information, child protective services is a reactive system, requires referral, but there are other community partners who might assess risk (e.g. Community Health), United Way and ABC are working on Community Information system, CPS (State) does not allow uploading of data

What happens during the screening and assignment process

- Information received from the reporter is the primary source to make a screening decision. C Cap check (criminal history, time in jail) can be used to identify parental behavior indicators, weighted judgment on the information that is available, social work profession has a high code of ethics, discourages looking at social media information.
- Assignment of referrals to case workers along several decision points. First, who takes the call (four people at the agency to take the calls), experience could vary in the documentation. Training is fairly consistent and ability to get to appropriate documentation, not a lot of turnover. Leadership team makes a decision on what to do and who to assign. Screening decision in 24 hours by a member of the supervisory team.
- How the decision is made is not formalized, it is based on experience and intuition. A hybrid with an expert system is conceivable, a decision tree. Especially helpful for new staff. There is a decision algorithm being piloted on the East Coast (north Carolina) National safety model, states have ability to modify. Wisconsin model used to have an indicator system that went away because it did not yield good results.

Additional Context (2/3)

Notes from a conversation with a HHS Department

What actions happen “in the field”

- Case worker now goes out to make initial contact. Could be same day cases (whoever is next on the list goes out), determine safety at the point of each contact. Gather lots of information, there are certain standards for initial assessment (next phase in the process after access). Basic guidelines on what on how. Sample questions, training has been provided.
- Same day cases require to pay attention to certain things to stabilize the situation right away. Possible or impending likely cases or 5 day cases are the next levels (3 levels in total). Workers have some indicators based on that classification what to pay attention to. Assessment support system could be applied. Important: should not impair the ability of the person to build a relationship. This should never feel automated, with a screen between. Recording and analyzing the conversation (NLP) could be a huge value added.
- Multiple touchpoints need to be covered in the assessment, Law enforcement information comes in, relatives provide information, other sources. Enter individual contacts and case notes, then write the assessment. There is no upload capability, no summarization capability or search. Digitizing the input would be huge value already, especially in big case files.
- Assessment is a summary of the information and specifically of safety (impending dangers). Action is not contingent on the assessment, As is merely documentation of what and why.
- Linkage between assessment and action is based on standards and feedback of supervisors. If we had better visibility into gathered information and pair it up with knowledge about historical cases. How do we make all of this applicable to our workers in the field (other than personal memory).
- Action can be triggered right away. Assessment of present danger. Some are very intuitive, based on quick judgments to ensure safety. Put a plan in place that parents agree with or take custody of the child. As they gather additional information, they make the assessment of impending dangers. If we don't do x, something bad is going to happen.

Additional Context (3/3)

Notes from a conversation with a HHS Department

How does Child Protective Services interact with others

- Blockchain aspect: we are drawing in a lot of information. But we do not release information to anyone. Exception would be law enforcement. State wide data system are only accessible to the State and Counties.
- In ongoing case management there is more interplay with schools. State is working on a portal, is piloted in Dane County. Ongoing is a continuation based on the initial assessment which revealed safety concerns, may go through court system with orders, could be an informal dispositional agreement up to a year with case managers assigned.
- Analysis of outcomes is limited to most egregious (e.g. death in foster care, bad situation), report to the State, review by the State. Local level review of all cases and outcomes is not conducted. State will conduct a compliance review regarding following the rules in preparation for Federal Audit. If a feedback loop could be built (e.g. which programs lead to better outcomes), it would be tremendously helpful. We don't have analysis of follow ups with families, etc. No system to track long term success and outcomes.
- Department of Children and Families at the State level.

Child Protective Serv. – Research Sources

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Topic	Author	Source/Link	Comment
Risk Assessment and Decision Making in Child Protective Services:	Stephanie Cuccaro-Alamina, Regan Fousta Rhema Vaithianathan Emily Putnam-Hornstein	http://www.datanetwork.org/wp-content/uploads/Putnam-Hornstein_CYSRSubmission_06062017.pdf	Great overview of the risk assessment process in CPS and how predictive risk modeling could be used
Using Analytics to Protect At-Risk Children	Bright Talk	https://www.brighttalk.com/webcast/10755/296765/using-analytics-to-protect-at-risk-children	Link to a webinar on advanced analytics in child protection, did not register, so not sure if you can watch the recording
Saving children through cognitive computing	Courtney Belme	https://www.govloop.com/saving-children-cognitive-computing/	Blog article which describes the key challenge and opportunity
Improving Processes & Practices in Child Welfare: Is cognitive computing part of the solution?	IBM	https://www.ibm.com/blogs/watson-health/improving-child-welfare-processes/	Link to a detailed IBM paper referenced in the article above, need to register to read
How Robots Could Help Police Interview Kids Involved In Child Abuse Cases	Abby Norman	https://www.romper.com/p/how-robots-could-help-police-interview-kids-involved-in-child-abuse-cases-46449	Different angle on the use of AI in the assessment process rather than in risk classification, AI as a tool to avoid bias and coerced response

Child Protective Serv. – Research Summary

There are multiple tech opportunities along the CPS process

- The CPS process includes access/referral, assessment, action, and ultimately analysis. Several uses of cognitive solutions are conceivable mainly in the assessment phase from interviewing and digital analysis of extensive files/records to enhanced risk categorization, but also on the admin side (e.g. optimization of skill matching with case characteristics).

AI may play a bigger role than Blockchain

- When we assigned this use case to the Blockchain group we assumed that there was a lot more data sharing about the individual cases. That is not really the case, but some of it occurs.
- The bigger opportunities are in the core process of CPS and typically leverage cognitive solutions from AI to Natural Language skills for document analysis

Mining knowledge and building AI based expert systems could be a game changer

- Each case is handled on a stand alone basis and the bridge to lessons learned is the individual experience of the worker or supervisor. That level of experience varies dramatically at the worker level and no effective support/knowledge systems exist to assist with risk identification/classification or selection of intervention options.
- A big missed opportunity may be mining the vast data of prior cases to identify successful intervention strategies.

Child Protective Services Status

- Due to several short notice facilitator cancellations we were not able to hold the CPS working group discussion. We are hoping to bring this topic to a different forum to have the conversation.

The Digital County – Documentation of Outcomes

Summary of Use Cases

September 10th, 2018



The End is not the End

- You may have read the entire report, or parts of it, or skipped to/started from the end. Either way, the notion will not have escaped you that there is much work yet to be done
- Our goal is to develop a communication plan, share these findings with a range of audiences, and initiate a change dynamic in the state. This may require small steps initially (as several working groups have pointed out in their assessment of obstacles towards change)
- We hope to have more tangible news on next steps soon, but wanted to get this report out to all those who have eagerly awaited its arrival and to those who are learning about our efforts for the first time
- If you are interested in becoming involved in the Digital County movement in Wisconsin, please contact your County Executive and Administrator. They are the ones who need to become aware of the desire and willingness to move forward within their ranks of employees and among their constituents.