Re-envisioning Data Infrastructure

Public Safety

Data Infrastructure Improvement Project

Recommendations and Requirements

Submitted to:
Department of Public Safety, State of Hawai'i
Research and Evaluation in Public Safety (REPS) Project at Research Corporation of the University of Hawai'i (RCUH)

January 2019

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Submitted to: Department of Public Safety, State of Hawaii
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Preface

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+ Purpose of the Data Infrastructure Improvement Project
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How the Project Came About

Re-envisioning Data Infrastructure was the title of our response to Research and Evaluation in Public Safety's Request for Proposal (RFP) posted in late 2014. From the outset, our desire was to frame the project from the perspective of what the Department of Public Safety's data infrastructure is and can be.

The RFP was triggered by an expected sunsetting of the current Motorola Offendertrak system which has been in use since 1999. The request was for a needs assessment geared towards understanding requirements for a new corrections management system while taking a very broad perspective to include information needs for "evaluation, operational and managerial matters as well as across agencies when information sharing is required."

At this time, the Offendertrak application continues to be supported and there are no specific dates for termination of the support. However, the Department of Public Safety (PSD) recognizes the need to plan for transition. The Data Infrastructure Improvement Project (DIIP) is intended to facilitate that plan.

Purpose of the Data Infrastructure Improvement Project

The purpose of the DIIP was to support the Research and Evaluation in Public Safety (REPS) project by addressing the underlying technology needs gaps that prevent REPS and Justice Reinvestment Initiative (JRI) projects from effectively performing studies, implementing programming, making program adjustments, or conducting program evaluations. REPS had identified issues with data breadth, data quality, data access, data sharing across operations and programs, and reporting capabilities. Their desire was to have a "dynamic approach to evaluation" to enable successful implementation of the JRI.

Our Approach

Our philosophy is that technology is about the confluence of people, processes and systems. We performed our assessment through observations, interviews, systems reviews, data reviews and development projects. PSD was thus an integral partner in our approach as we required a number of staff to provide time, access and support.

The broad requirements set forth by the DIIP required an examination of PSD's corrections operations and information as well as the department's data infrastructure and technology capabilities. We developed our understanding of current and future needs, product and project fit, and actionable implementation goals through the following areas of inquiry and corresponding methods of examination:

DESIRED FUTURE VISION

Through interviews and stakeholder meetings, we assessed the clarity of PSD's future vision. How the vision is articulated and the consistency across the organization informed us as to how vision is communicated, the challenges of messaging, the impact of work culture and the organization's experience with driving change.

CURRENT OPERATIONS PROCESSES

We captured formal and informal processes through interviews, observations, and paper artifacts that demonstrated how the department performs the tasks required for day-to-day operations. We considered the tools and contexts that facilitated or hampered the meeting of operational needs and assessed the gaps between what was needed but not provided.

SOFTWARE UTILIZATION

We first looked at the digital ecosystem for the department to identify larger patterns and implications for the data infrastructure. How were users being supported or not supported by their tools? With a focus on custody information management, primary corrections databases were reviewed to understand database structure. Data was reviewed to provide insight into historical database usage such as feature utilization, frequency of use, and depth or consistency of information. Observations and interviews of current and prior processes provided the context to help distinguish between utilization differences such as the impacts of context, individual usage considerations, and software-specific reasons.

DATA UTILIZATION

We considered data access needs and the use of reporting to evaluate how and when the department values data extraction. We gathered information on access and data usability to identify operational needs that are and are not met by the existing software applications and technology infrastructure with implications for broader issues such as policy, support and training.

SUCCESS MEASURES

Success of the department's technology use was evaluated by how well the tools serve the department's operational objectives. We asked how software's original intended uses compare to the expectations for use today? How do those initial plans compare to historical use findings? We also sought to understand how usage has changed and how well the software has been customized or maintained to meet those changing needs. We looked back to the qualitative research findings to identify root cause issues and key points for future success.

Project Timeline

The DIIP was broken into three phases such that findings of the preceding phase could be used to inform decisions whether to continue with the following phase. The following is an overview of the project phases and deliverables to date:

Phase I
February 2015 – July 2015
Research and Phase I Report

- Research across administrative functions and line persons for O'ahu corrections-related facilities inclusive of the administratively attached Hawaii Paroling Authority (HPA), Correctional Industries (CI) and Crime Victims Compensation Commission (CVCC).
- Survey of other jurisdictions on their needs and systems.
- Overview and comparison of corrections management software.
- Synthesis and mapping/diagramming of custody flows, information flows, uses of custody information and uses of Offendertrak system

Phase IIa
July 2016 – August 2017
Additional Research and Strategic Planning Recommendations

- Research across administrative functions and line persons for Hawai'i, Maui and Kaua'i corrections-related facilities.
- In depth research of case management operations at WCCC for user-facing small project
- Obtain data for data and systems analysis
- Synthesis of people, systems, and information processes to determine strategic planning recommendations and setup for IT transformational work of Phase IIb

Phase IIb
September 2017 – January 2019
Small Projects, Final Recommendations

- Custody data and systems analysis
- Guided transformational IT capability development (IT governance body work)
- Small project software design and development with analysis of software project needs and capabilities
- Synthesis of people, systems, and information processes for final recommendations

Phase III
Phase III, proposed as an optional phase, was intended to provide support as needed for a larger-scale software project implementation. Based on the findings of Phase II, Phase III is not recommended for continuation at this time. PSD has significant gaps to address before a larger-scale software implementation is advised.

Purpose of Report

This report comes at the completion of Phase II of the DIIP and builds on earlier findings. Its primary purpose is to provide PSD with recommendations and requirements for moving towards a sustainable technology foundation of which a new corrections management system is a part. The recommendations and requirements are written for the primary audience of PSD's Information Technology (IT) governance body with the purpose of guiding improvement actions towards project readiness. REPS is a secondary audience and the report is intended to inform planning purposes and provide reference materials for continued work with PSD.

Report Contents

Included in this report are:

- Phase II assessment findings with recommendations and requirements for developing software project readiness;
- guidance for the hows and whys of making technology purchase decisions for the department's current state, including recommendations for Offendertrak replacement;
- information on existing custody data;
- and tools and references to help PSD develop a variety skills and competencies that are useful in managing or participating in technology projects.

The analyses are based on the organizational structure, department policies, processes, systems and personnel we observed or worked with between February 2015 and the date of publication of this document. Our assessment captured observed processes and verbalized needs for O'ahu, Hawai'i, Maui and Kaua'i. Custody information needs and flows were reviewed for PSD operations to include Corrections Division, Law Enforcement's Sheriff Division, Administration Division, HPA, CI and CVCC. Where appropriate, we included First Circuit Court custody information and Honolulu Police Department processes. All other state agency considerations were evaluated from the information gathered from within PSD about those relationships.

Much of what is assembled here has been shared with the PSD administration ahead of this report. Note that most of the first phase findings, insights, and documentation are not replicated here. Reference items such as corrections personnel personas, system diagrams, custody flow diagram, and information flow in the custody journey are to be found in the first publication. We hope that this report brings the information together to provide an actionable resource as the Department continues to develop its technology capabilities.

1

Introduction

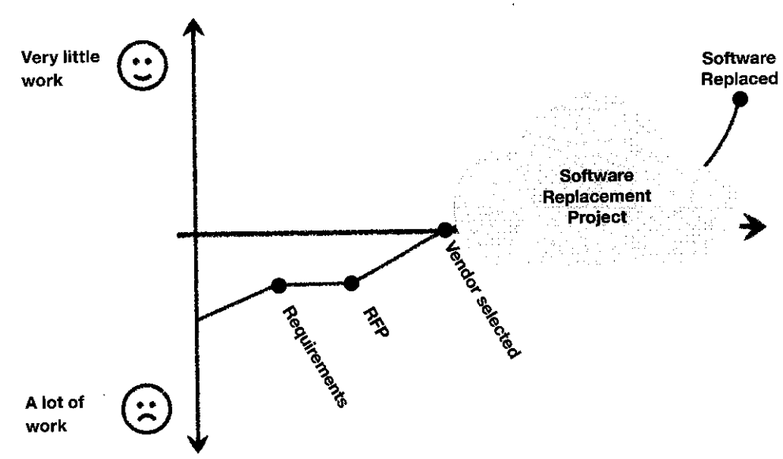
+ Opportunities of Software Replacement
+ Building Awareness
+ Building a Foundation
+ References Used in Evaluation
+ Technology Starts with People

Opportunities of Software Replacement

Software replacement is often perceived as an opportunity to address unmanaged issues, standardize operations, improve data access, increase operational efficiency and reduce paper all in one undertaking. However, such projects also come with a great amount of risk. Technology projects are powerful change agents and they require careful planning to appropriately direct the change. They also require persistent project management to follow-through and guide the project efforts to success.

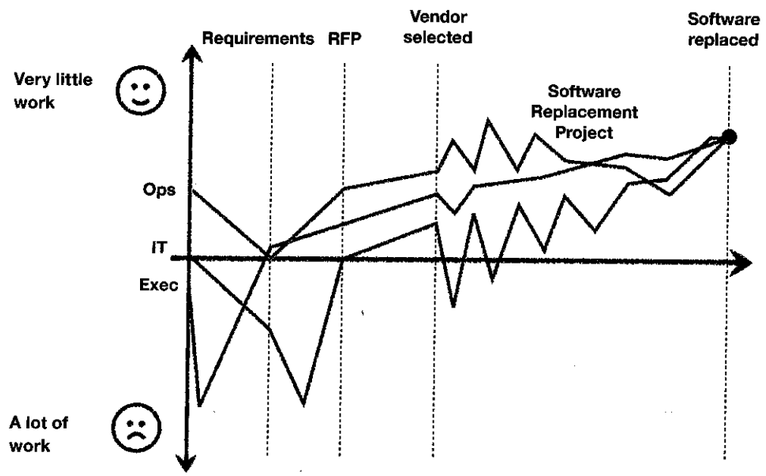
The Department of Public Safety and REPS knew that they wanted requirements in order to draft an RFP. However, through the research, we determined that the department's expectations of what that replacement project would look like and what it would take to get the department's desired outcomes were vastly different. The two mental models of the project were not compatible.

fig. 1a **PSD's Mental Model of a Software Project Experience**



The current mental model imagined that the starting point would be the low-point and getting to each consecutive milestone would be easier. The software project itself is opaque. The expectation is that this experience applies to everyone in the department.

fig. 1b **More Realistic Experience of an IT Project**



The likely experience of the milestones for the software replacement project are more volatile and differ based on the person's role (operations, IT/project management team, executive). The dips represent periods of significant work. There is a lot of upfront work and the software replacement project will also require continuous engagement to manage the project to ensure a positive trajectory.

Building Awareness

The following assessments, recommendations, requirements and references are intended to provide insight and guidance across the broad spectrum of needs for delivering a successful project. Our primary goal is to build the Department's risk awareness to avoid catastrophic failure.

For a software project, catastrophic failure includes outcomes such as:

- project abandonment after a large commitment of resources,
- poor software implementation such that operations are severely impacted and
- poor planning such that budgeted costs are fully expended through deployment prohibiting necessary customizations to keep the software functional beyond a short period of time.

We assume that catastrophic failure is an unacceptable outcome for any software project.

Building a Foundation

We have structured the report to build the foundation for your IT decisions starting with its most critical parts. We start with executive level considerations and work through to corrections operations as many of the executive level issues encompass or are the root cause for IT management issues and so on.

We have attempted to distill the findings and recommendations into the fewest actionable, high-priority, impactful takeaways as possible. The goal is to keep the IT governance body focused to make the progress sustainable. There is a lot to consider and having you feeling overwhelmed would be counterproductive.

We are as direct as possible. Responsibility, where assigned, is with whom we think is best able to take action on the recommendation; it is not a placing of blame.

The recommendations are split into four parts to better address the different types of needs and perspectives of a software replacement project:

IT STRATEGY:

Executive-level findings and recommendations, providing insight and guidance on the big picture of software replacement and the requirements for goal setting and strategic direction required prior to software replacement considerations

IT OPERATIONS:

Administrative-level findings and recommendations for the IT capabilities required by software replacement projects

CORRECTIONS OPERATIONS:

Operations-level findings and recommendations, with guidance on how to evaluate current operations and consider requirements for design and development of processes that become central to a software project plan

SOFTWARE REPLACEMENT:

Informational guidance and recommendations for how to evaluate software options when you are ready to take the next step

References Used in Evaluation

Within our evaluation we refer to three frameworks that we find useful for communicating what improvement may look like. The evaluations of the current state are not a determination of "goodness" but indicate a relative state of readiness in relation to best practices and in the context of desire to do a system replacement project. See References in the Appendix for full details. The frameworks are:

COBIT 5

COBIT stands for Control Objectives for Information and Related Technologies and COBIT 5 is a specific framework developed by ISACA (previously known as Information Systems Audit and Control Association, but now goes by ISACA only). ISACA is an international professional association focused on IT governance and management. Their framework provides best practices guidelines and means for evaluating governance and management requirements. As ISACA is from an auditing perspective, it is particularly helpful in regards to clearly identifying and managing IT risks.

ENTERPRISE ARCHITECTURE AS STRATEGY

This is a non-sector specific, IT industry reference that clearly articulates the relationship between business strategy and information technology with frameworks such as operating models and enterprise architecture stages to make IT strategy actionable and tangible. It is also one of many references that discusses IT governance. The book was written by Jeanne Ross, Peter Weill and David Robertson and published by Harvard Business School Press.

FOUR A FRAMEWORK

This is a framework for discussion of IT risk from the perspective of foundational capability. The four A's are Availability, Access, Accuracy and Agility. The framework is appropriately focused and highly relevant to PSD in its earlier stages of digital maturity development where reducing risk is a priority for developing an IT foundation. The framework was developed by George Westerman and Richard Hunter in their research article, "Developing a Common Language About IT Risk Management" published by Massachusetts Institute of Technology's Center for Information Systems Research at the Sloan School of Management.

Technology Starts with People

You may be surprised that despite the impact on technical outcomes, many of the recommendations are not expressly technical in nature. Software and technology are built upon people processes. Without people processes, there is nothing to model or build, no direction or oversight to ensure that what is being built is what was desired. The hardest work in building the right technology toolset is in working with people — the debates over priorities, negotiating compromises, developing and agreeing on a standard process, hiring or developing skilled personnel, communicating changes, providing negative feedback and so on. These processes, once defined, are like scaffolding for building structures. It allows you flexibility to build what you want but provides a reusable framework. There are many decisions to be made in developing a software tool and if they are not defined, discussed, or questioned by the Department, they will be left to whomever is closest to the code-writing and furthest from the operations knowledge. Technology is an investment that goes beyond tooling and if you are only able to take one thing from this report, it is that technology starts with people.

2

IT Strategy

Findings, insights, recommendations and requirements that pertain to the **executive level** action.

+ High Risk
+ IT Governance
+ IT Management
+ IT Risk Awareness
+ Executive Level Action Items:
    - Define the key operating models for PSD
    - Define the role of IT
    - Provide IT direction and oversight
    - Develop an IT approval process
    - Communicate IT strategy and demonstrate leadership
    - Develop enterprise architecture
    - Develop a culture of risk awareness
    - IT performance goals
    - Define IT costs and services
    - Track projects
    - Evaluate business value

High Risk

The Four A Framework by Westerman and Hunter identifies four fundamental characteristics that represent the kinds of risks to operational performance. There are issues in all four areas.

In order to change course there are three components that require executive-level attention:

- **IT governance** — setting strategy and providing oversight to put IT actions and strategic goals in alignment
- **IT management** — infrastructure, applications and personnel — to enable reliable operational performance
- **IT risk awareness** — the shared responsibility of controlling risk with communications and processes to ensure risks are managed in a timely manner. Governance and management mechanisms help to develop IT risk awareness

fig. 2 **The "Four A Framework" categorizing types of IT risk**

***every* IT decision places some level of risk on operational performance:**

- **Agility**
  Changing with acceptable cost & speed
- **Accuracy**
  Ensuring information is accurate, timely, and complete
- **Availability**
  Keeping business processes running
- **Access**
  Providing information to the right people (and not the wrong ones)

"There is no such thing as a risk-free or risk-neutral IT decision."
(Westerman and Hunter)

Any IT related decision will have some type of impact on the operational performance of the organization. Awareness of these risks, as categorized by this framework, will help an organization understand what trade-offs to consider to make a well-informed IT decision.

Framework from Westerman and Hunter, "Developing a Common Language About IT Risk Management," Center for Information Systems Research, June 2009.

IT Governance

IT governance is a new role and task for existing executive-level staff but also adds a new executive-level IT management role. See Fig 1. COBIT 5 Governance and Management Key Areas. The IT management role is described in more detail below.

IT governance provides strategic direction, oversight, and negotiated business priorities for the department as a whole. Many modern IT projects require discussion of policies, standards, processes, personnel, information and budgeting from a strategic perspective and with executive-level decision-making capability.

We have begun to lay the groundwork for an IT governance body through Phase IIb of the DIIP, working with executive staff and administrative staff with specific insights into the risks and opportunities for the Department. [redacted]

INFORMATION AND TECHNOLOGY (IT) GOVERNANCE

Is a subset discipline of corporate governance, focused on information and technology (IT) and its performance and risk management. The interest in IT governance is due to the ongoing need within organizations to focus value creation efforts on an organization's strategic objectives and to better manage the performance of those responsible for creating this value in the best interest of all stakeholders. It has evolved from The Principles of Scientific Management, Total Quality Management and ISO 9001 Quality management system.

Wikipedia: "Corporate governance of information technology," retrieved Jan 5, 2019.

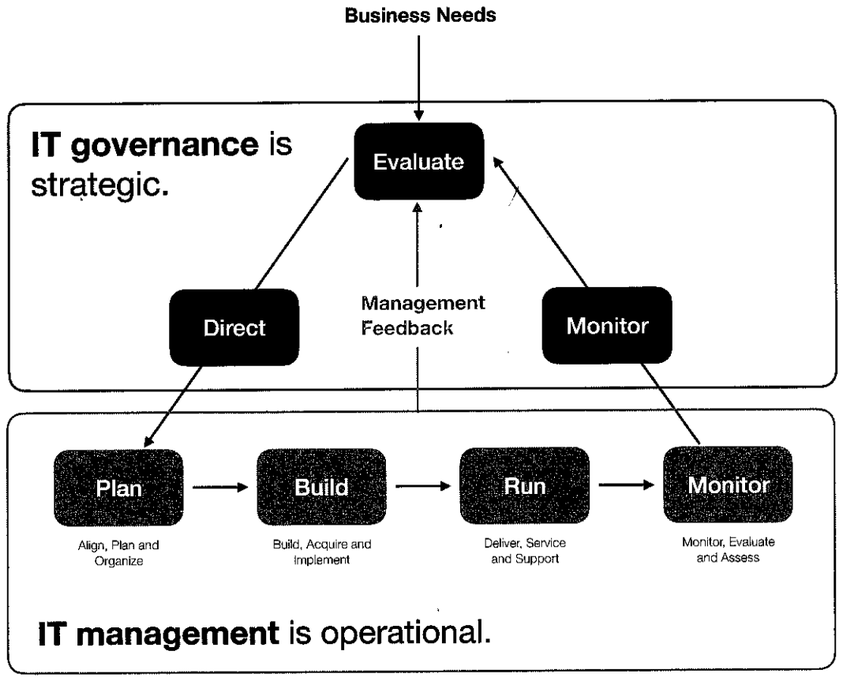
IT Management

Not to be confused with the IT functional manager, IT management represents the IT executive decision-making tasks that focus on translating the department goals and priorities into IT responsibilities and action. We are naming this role the "IT Officer" to help clarify the higher administrative and executive-level needs of the position. They should participate as a key member of the IT governance body and is whom to hold accountable for IT performance. [redacted]

The IT management position is an executive level position that needs to be able to make policy-level decisions for the Department.

fig. 3 **COBIT 5 Governance and Management Key Areas**

The diagram shows the distinction between the two roles—governance vs. management.



From *COBIT5: A Business Framework for the Governance and Management of Enterprise IT*, ISACA 2012.

Our recommendation is to provide the competency through an assemblage of skills until a person is found. The key skills are someone with leadership capabilities, specifically with project management and communication skills at a more senior management level that can gather input from those who are knowledgeable of technical capabilities and limitations, software and hardware. [redacted]

IT Risk Awareness

The Department practices risk avoidance, where responsibilities are avoided rather than managed. Risks are hidden to be exposed later when the issues grow too large to be unnoticeable. This is unacceptable. To change the culture to one of awareness requires executive-level support to initiate changes to the culture of work. It requires an emphasis on transparency, communication and support. Individuals should be encouraged to raise issues when they are identified and find the means to mitigate the issue or take corrective action.

We suggest that executive-level and administrative staff, look for system, process and broader management issues that are increasing the risk exposures. The executive level is responsible for making policy and standards changes to identify sources of risk, define tolerance levels and articulate standard, desired processes and corrective actions. IT management can help to evaluate and address the problem with technology fixes such as, but not limited to, developing applications that better support process needs, increasing monitoring and changing permissions.

The DIIP IT governance body discussions surfaced many high risk issues that were well-known or recognized as issues but had not been addressed. Some of these open risk discussions are listed in the IT Strategy Appendix and many are among the needs gaps covered in this report. Additional lines of constructive questioning from Westerman and Hunter's 4A framework are also provided along with methods such as the 5 Whys, Ishikawa Fishbone Diagramming and the Eisenhower Matrix for identifying, understanding root cause and prioritizing risks.

Taking Action to Reduce Risk and Develop a Foundation

The following action items are to be addressed by the IT governance body members, inclusive of the IT Officer. They address risk issues and define required governance mechanisms for evaluation, direction and monitoring that form the foundation for the department's IT needs.

What can you do to create an IT Strategy for the Department of Public Safety—today?

The following action items reflect the requirements for developing an IT Strategy:

- ☐ Define the key operating models for PSD
- ☐ Define the role of IT
- ☐ Provide IT direction and oversight
- ☐ Develop an IT approval process
- ☐ Communicate IT strategy and demonstrate leadership
- ☐ Develop enterprise architecture
- ☐ Develop a culture of risk awareness
- ☐ IT performance goals
- ☐ Define IT costs and services
- ☐ Track projects
- ☐ Evaluate business value

REQUIREMENT:

Define the key operating models for PSD

The Department of Public Safety should identify an operating model for each functional operations group (division, business unit, etc.).

WHO IS RESPONSIBLE:

IT Governance Body

- *Director*
- *Deputy Director of Law Enforcement*
- *Deputy Director of Corrections*
- *Deputy Director of Administration*
- *Business Management Officer*
- *IT Officer*

TYPE OF ACTIVITY:

Evaluation

LEVEL OF DIFFICULTY:

Low

Does not require any data gathering, decision-making only.

BENEFIT TO THE DEPARTMENT: Each operations has a starting point for evaluating how to address any new business need — who should be involved in the design decisions, how a specific technology might provide a service and the types of infrastructure that are required.

DESCRIPTION

Background information

Operating models provide a mental model for how operations should be run. This is essential to the discussion of how services should be delivered. The model also helps to clarify the role of technology for different functions or subsets of the organization. *Enterprise Architecture as Strategy* uses a four quadrant framework to distinguish operating models by level of process integration and process standardization. *(See Figure 1 on next page.)*

> **Operating model** is both an abstract or visual representation (model) of how an organization delivers value to its customers or beneficiaries as well as how an organisation actually runs itself.
>
> *Wikipedia: "Operating model," retrieved Jan 5, 2019.*

Using this framework, each model also implies specific technology needs. Selection of the appropriate operating model for each business group will provide guidance for making IT decisions. Developing a cohesive data infrastructure becomes a more structured evaluation process.

fig. 4 **Operating Models**

Characteristics of four operating models as applied to PSD operations.

Different parts of PSD's operations can be placed into the framework in various ways. The framework provides a helpful means of reasoning about how to apply technology infrastructure to meet operational needs.

High Process Integration

Coordination

- Operationally unique functions
- Autonomous management
- Shared customers and data
- Consensus processes for designing IT infrastructure services; IT application decisions made in business units

PSD example: Corrections operations inclusive of end-to-end custody management and public services—jails and prisons, HCI, HPA, CVCC, and some LE operations

Unification

- Similar or overlapping operations
- Integrated processes with support of enterprise systems
- Process owners design standardized processes
- Centrally mandated databases
- IT decisions made centrally

PSD example: Custody management at the facility level ([redacted]

Low Process Integration

Diversification

- Few shared customers or suppliers
- Independent transactions
- Operationally unique business units
- Business unit control over business process design
- Shared IT services provide economies of scale

PSD example: Oversight of PSD's divisions and offices such as LE, Corrections, Investigations (LCO, IA, CRCO) and MIS.

Replication

- Few shared customers
- Independent transactions aggregated at a high level
- Operationally similar business units
- Autonomous business unit leaders with limited discretion over processes
- Centralized control over business process design
- Centrally mandated IT services

PSD example: Administrative functions throughout PSD's facilities (business offices, fiscal/planning, personnel) following state processes

Low Process Standardization

High Process Standardization

Source: *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution*, J. Ross, P. Weill, D. Robertson, HBS Press, 2006.

fig. 5 **Comparison of What's Shared Between Different Operating Models**
From Enterprise Architecture as Strategy

COMPONENT	COORDINATION	UNIFICATION	DIVERSIFICATION	REPLICATION
Customer data	✓	✓		
Product data	✓	✓		
Shared services	✓	✓	✓	✓
Infrastructure technology	✓	✓	✓	
Portal technology	✓			
Middleware technology	✓			
Operational processes		✓		✓
Decision making processes		✓		
Application systems		✓		
Systems component technology			✓	

FINDINGS
PSD's current situation

[redacted]

RECOMMENDATION
Possible ways to address the current situation

Review the operating model recommendations we have developed for you based on our research. Determine what changes you would want to make and articulate why. Document what your decisions are and a brief qualitative description about how you think operations should run for each of the divisions. It is important to share this vision for each division with the full IT governance body because it will allow everyone to make more informed decisions.

TYPES OF ACTIVITIES

- ☐ Analyze business functions and decide how standardized or integrated processes should be. Assign the function to the corresponding quadrant and operating model. If there is not enough clarity to make a decision, consider how much data is shared between subgroups under consideration. More shared data is an indication of higher process integration.

RESOURCES/ REFERENCES
Possible Outcomes

See Appendix *IT Governance Framework—Strategy* (page 115) for recommended Operating Models.

REQUIREMENT:

Define the role of IT

Clearly articulate the strategic purpose of IT that covers the use of technology, who is to provide IT services, what those services are, and how they are to be delivered for the department as a whole.

WHO IS RESPONSIBLE:

IT Governance Body

- *Director*
- *Deputy Director of Law Enforcement*
- *Deputy Director of Corrections*
- *Deputy Director of Administration*
- *Business Management Officer*
- *IT Officer*

TYPE OF ACTIVITY:

Evaluation

LEVEL OF DIFFICULTY:

Moderate

Requires discussion, investigation, negotiation, prioritization, decision-making and communication.

BENEFIT TO THE DEPARTMENT: The department would be aware of the services that are reliably offered by MIS with knowledge of when and why vendor services may need to be procured. Business units would be able to determine upfront whether or not a technology tool would be worthwhile to investigate for consideration. An increased awareness of the value, costs and limitations of IT helps to define the needs gap for better communication of resource requirements.

DESCRIPTION

Background information

Information Technology is more than technology tools and support; it is the management of information in support of operations and is often a component or driver in organizational change. Information Technology (IT) may relate to tools, infrastructure, policy, processes and personnel. The role of IT has and will continue to evolve with technology capabilities.

> **Organizational change:** a process in which a large company or organization changes its working methods or aims, for example in order to develop and deal with new situations or markets
>
> *Dictionary.cambridge.org: "organizational change," retrieved Jan 5, 2019.*

FINDINGS

PSD's current situation

PSD views IT as a catch-all for technology-based tools and support. The tacit assumption is that Management Information Services (MIS) should be responsible for all technology support tasks. This is a broad, undefined scope of responsibilities for such few staff. According to numbers from a Gartner study, the number of IT staff to support the department's needs would be expected to be at least an order of magnitude greater than its present size based on the number of full-time-employees in the department.[1]

FINDINGS *continued*

The role of MIS has become that of a help desk with basic desktop and networking support and very limited systems administration. Operational needs far exceed MIS' bandwidth and capability. However, considering the scale of MIS operations, expectations for consistent, reliable, highly responsive and detail-oriented service and support are untenable. Without a clearly defined role, there is no means to begin to evaluate MIS performance.

A look at department processes shows the result of operations efforts unsupported by IT. **Many business units managed their own systems from planning to implementation either by choice or out of necessity.** As a result, many processes are manual and not integrated. Issues have not been addressed so workarounds are part of standard processes. Operations remain siloed as broader needs were not or could not be included in the system's requirements.

The state's Office of Enterprise Technology Services (ETS) ideally would be able to provide guidance for general infrastructure decisions, such as with shared services software that may be replicated across other agencies. However, aside from the deployment of a few specific statewide projects, there has been little of such support.

RECOMMENDATION

Possible ways to address the current situation

Define the purpose of technology use in the department. Start with the goals and objectives that are critical and how they need to be supported. What are the expectations for reliably performed operational activities? Identify what MIS is currently capable of and what the desired capabilities are. Clearly articulate and communicate the intentions of the department in terms of why technology is used and supported.

TYPES OF ACTIVITIES

- ☐ Identify current resource assignments and capabilities
- ☐ Evaluate existing IT vendor contracts for the types of services provided
- ☐ Identify and prioritize PSD's primary goals for using technology (security purposes, timely communication, precision documentation, standardizing processes, etc.)
- ☐ Identify typical operational needs such as type of support, how support should be delivered, responsiveness, etc.; prioritize needs
- ☐ Identify which needs are more capable of being outsourced with success and which require in-house knowledge/control
- ☐ Identify realistic expectations for the existing IT team based on known capabilities and potential skill development in case of skill gaps
- ☐ Create and communicate a clear statement of IT goals with MIS' role in meeting those goals based on department goals and determine how to address any needs gaps

RESOURCES/ REFERENCES

Possible Outcomes

See Appendix *IT Governance Framework — Strategy* (page 115) and *IT Governance Framework — Goals* (page 116) for a bigger picture of operational needs for the department and IT.

1. From Gartner IT Key Metrics Data: 2012 IT Enterprise Summary Report that stated that in 2011, for state/local government, IT staff made up 3.6% of all full-time employees and IT spending per employee was $7,773. Calculating this for roughly 2,600 PSD employees, this would come out to 93 IT staff and $20 million for IT spending. The IT staff may include borrowed staff, contractors, and vendors.

REQUIREMENT:

Provide IT direction and oversight

Clearly define IT governance mechanisms that allow for the evaluation, direction and monitoring of IT concerns.

WHO IS RESPONSIBLE:

IT Governance Body

- *Director*
- *Deputy Director of Law Enforcement*
- *Deputy Director of Corrections*
- *Deputy Director of Administration*
- *Business Management Officer*
- *IT Officer*

TYPE OF ACTIVITY:

Direction

LEVEL OF DIFFICULTY:

Moderate

Requires discussion, investigation, negotiation, prioritization, decision-making and communication. Ongoing commitment.

BENEFIT TO THE DEPARTMENT: Because the executive-level is aware and engaged in directing IT efforts, they would understand the value of IT and use it to make organizational changes to meet strategic goals. Risks could be averted and when problems arise the Department could be more responsive and able to develop a mitigation plan. Because of continuous oversight, the Department would be enabled to provide more transparency and could speak to efforts to improve operations or meet future challenges.

DESCRIPTION

Background information

Modern IT projects are often synonymous with change management projects because they are tasked with breaking down work silos, increasing data access and automating workflows that make significant changes to the ways people work. Process changes lay at the core of most technology implementations.

Discussion and prioritization of competing needs and risks is required by those who can make those decisions — the executives. Evaluating projects for strategic alignment, directing action, communicating priorities and decisions is the responsibility of a governance committee comprised of executive-level members. A committee is required because IT is a shared responsibility in these projects that often involve multiple stakeholders. Topics may include data rights, data sharing/permissions, risk management, budget spending etc. It is at this level that policies are made or revised, priorities negotiated and exceptions granted.

FINDINGS

PSD's current situation

PSD is run as a top-down organization. Changes that are desired for front-line operations require buy-in and support from above. However, MIS does not receive strategic direction nor are they given feedback through oversight activities. **IT is solely handled at a business-unit-level. This effectively communicates that IT is a non-critical component of operations.** [redacted]

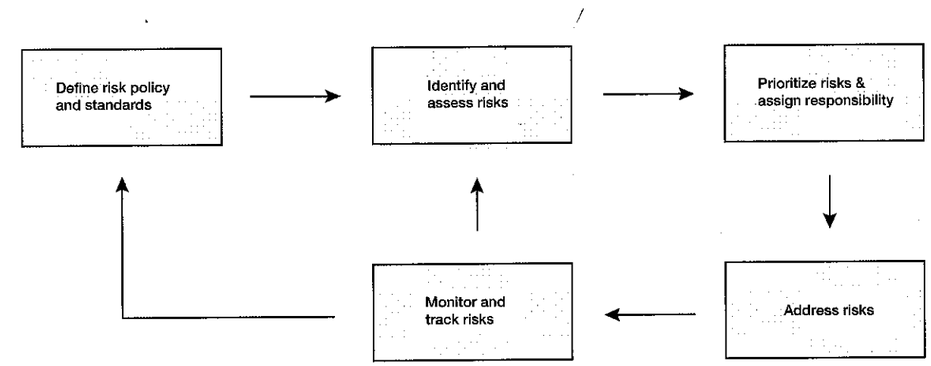
FINDINGS *continued*

[redacted] IT is underestimated for its risks and undervalued in its opportunities. The reason is that the Department has no existing oversight committee. [redacted]

RECOMMENDATION

Possible ways to address the current situation

Formalize the IT Governance Body to have regular meetings for the review of risks, moving forward action items, monitoring of ongoing IT projects and discussing new project proposals. Decisions should be made formally and publicly for clarity and accountability. Output from the meetings may include communications on goals, priorities, policies, standards, measures, exceptions and inquiries. Continue the existing policy and standards under discussion and see them through to completion.



Review the above flow chart and consider defining what each of these tasks means, and how you, the IT governance body, is to perform each of these tasks above. If everything can be accommodated in the format of a regular meeting, you should be clear about the meeting format and identify who may be responsible for leading the meeting, providing followup, and so on.

TYPES OF ACTIVITIES

- ☐ Review high priority open items for current status and identify new actions and accountabilities
- ☐ Review any newly identified risks; prioritize and identify actions and accountabilities as necessary
- ☐ Review any new project proposals and approval status
- ☐ Close out action items with lessons learned or a monitoring plan as necessary

RESOURCES/ REFERENCES

See Appendix *IT Governance Framework* (pages 115–117), *Eisenhower Matrix* (page 124), *IT Governance Risk Discussion List* (page 120), *Six IT Decisions That Your IT People Shouldn't Make* (page 125)

REQUIREMENT:

Communicate IT strategy and demonstrate leadership

Set standards and mechanisms for IT strategy communication. Provide opportunities to disseminate information, receive inquiries and concerns and respond to questions.

WHO IS RESPONSIBLE:

IT Governance Body

- *Director*
- *Deputy Director of Law Enforcement*
- *Deputy Director of Corrections*
- *Deputy Director of Administration*
- *Business Management Officer*
- *IT Officer*

TYPE OF ACTIVITY:

Direction

LEVEL OF DIFFICULTY:

Moderate

Requires decision-making and some process development.

BENEFIT TO THE DEPARTMENT: Policies, standards, changes, exceptions and major activities such as project approvals could be well-communicated. All employees are able to be confident in knowing that information on major department IT changes is being shared and they would know where to go to get pertinent information. The department would have an increased sense of transparency. Processes could feel better-managed with increased feelings of support due to executive engagement. Transparency and openness of communications reduces the risk of developing internal factions by enabling more visible discussion and resolution.

DESCRIPTION

Background information

IT strategy provides a broad unifying vision for how operations should be run. To implement a change, communication of this vision is required. Change projects require continuous communication to ensure that the organization is aware of the changes and is provided an opportunity to develop understanding and buy-in. Lack of sufficient formal communication can, at worst, breed anxiety, distrust and conspiracy theories that undermines efforts.

FINDINGS

PSD's current situation

There has been no IT strategy to date and therefore no centralized communication channel for such efforts. [redacted] **The default position of most employees is one of "wait and see" as there has been little history of communication and follow-through to result in**

FINDINGS *continued*

positive outcomes. The proof comes in implementation only and even with the implementation, lack of support or clear ownership can leave users feeling unsettled about these solutions.

Business units that demonstrated a unified sense of purpose and an understanding of the strategic goals for their operations were more interested and optimistic in considering process changes and technology projects. They conveyed that they had more communication and engagement with their administrators. There was more clarity and precision in articulating what they perceived as an opportunity for change. Communication practices have been dependent upon individual administrators' personal leadership styles rather than a department-wide expectation for managing change project communications.

RECOMMENDATION

Possible ways to address the current situation

Identify a point person at the executive level who would be responsible for communicating IT governance activities and decisions. Identify a point person to facilitate engagement with the broader department including receiving questions regarding IT process changes. They may be the same person. You may want to consider likely mechanisms for communication to determine if a new channel for communication is desirable. For example, memos and existing formal meetings between administration and staff might be sufficient to roll out information. When processes are more developed, having a dashboard or intranet site might be useful for posting IT governance policies, standards, risk actions, project status and sharing and answering commonly asked questions.

TYPES OF ACTIVITIES

- ☐ Identify existing executive level through to business unit communication. Evaluate frequency and medium (formal meetings, memos, etc.) to determine if any are adequate in the context of a process change project; address gaps as necessary.

RESOURCES/ REFERENCES

Possible Outcomes

See Appendix *IT Governance Framework — Decisions* (page 117) for information on the kind of information the might be distributed and the necessary mechanisms that may be part of the communication requirements.

REQUIREMENT:

Develop an enterprise architecture

Develop an enterprise architecture diagram or written document that clearly communicates the IT strategy

WHO IS RESPONSIBLE:

IT Governance Body

- *Director*
- *Deputy Director of Law Enforcement*
- *Deputy Director of Corrections*
- *Deputy Director of Administration*
- *Business Management Officer*
- *IT Officer*

TYPE OF ACTIVITY:

Direction

LEVEL OF DIFFICULTY:

Moderate

Primarily a decision-making activity with incorporation of possibly unfamiliar technology concepts.

BENEFIT TO THE DEPARTMENT: MIS and the department as a whole would have a framework for thinking about their operations and how technology is used to manage core operations processes and information. MIS would be able to make decisions more quickly about selecting solutions and can better address operational needs. Different business units would be able to consider the bigger picture in thinking about how their specific needs might fit into the larger divisional requirements and support department capabilities.

DESCRIPTION

Background information

Enterprise architecture is a conceptual framework that describes how operations are managed. It provides the foundation for the design of business processes through to technical systems including the data infrastructure. This is essential for all software projects and is critical on larger projects, such as the corrections system replacement, for which the desired end-result is broad system access, data-sharing and coordinated processes.

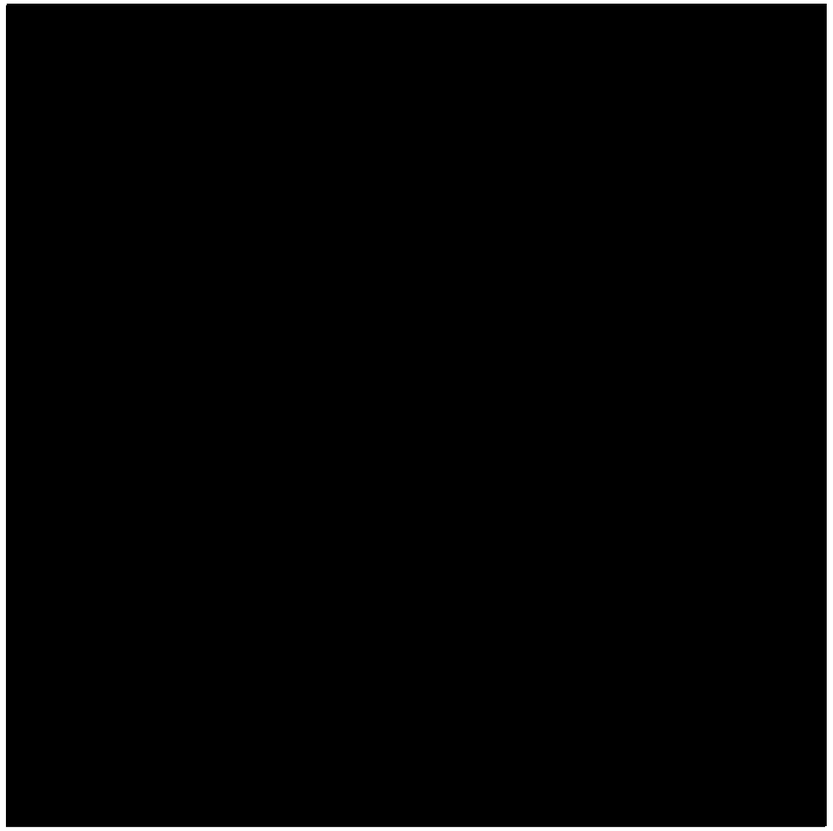
Enterprise architecture (EA) is "a well-defined practice for conducting enterprise analysis, design, planning, and implementation, using a comprehensive approach at all times, for the successful development and execution of strategy. Enterprise architecture applies architecture principles and practices to guide organizations through the business, information, process, and technology changes necessary to execute their strategies. These practices utilize the various aspects of an enterprise to identify, motivate, and achieve these changes."

—Federation of EA Professional Organizations, "Common Perspectives on Enterprise Architecture"

Wikipedia: "Enterprise Architecture," retrieved Jan 5, 2019.

fig. 6 **Four Stages of Architecture Maturity**

These four stages are sequential but can progress at different rates. The rate of transition is dependent on the rate of building new competencies. Software projects such as an Offendertrak replacement would come under stage three, "Optimized Core" where as running operations to be data-driven and having evaluation opportunities is a stage four goal, "Business Modularity." The Department is at the very entry into stage one, "Business Silos" and would need to develop standards and policies to move toward the second phase, "Standardized Technology."



Source: Enterprise Architecture as Strategy: Creating a Foundation for Business Execution, J. Ross, P. Weill, D. Robertson, Harvard Business School Press 2006.

FINDINGS

PSD's current situation

Enterprise architecture is an indicator of digital maturity. The Department is currently in the first stage, "Business Silos" in its digital maturity. *See Fig. 7 Four Stages of Architecture Maturity above.*

Digital maturity is the state of an organization's transformation over time towards develop technology competencies in response to the changing environment and organizational needs. The process is never complete but there are characteristics that are common across organizations that help define different stages. *See Fig. 6(above) Four Stages of Architecture Maturity*

The transitions are a progression of skill awareness, development and proficiency. *See Fig. 7 (next page) Learning Requirements of Each Stage*

FINDINGS *continued*

There are numerous competencies to be developed in the digital maturation process. *See Fig. 7 Learning Requirements of Each Stage.* The department has yet to learn some of these competencies. Many of the recommendations provided in this report are intended to guide the Department through the incomplete learnings and on to the next stage.

The critical next step is to formalize the strategy through the development of an enterprise architecture for all major operations areas. It will help to devise a plan for how to move IT decisions and IT capabilities forward.

RECOMMENDATION

Possible ways to address the current situation

Review the operating models for each of the major operations areas and consider the role of IT for the department. An example of an enterprise architecture model for the department and for Corrections are provided in the Appendix. You may want to complete an enterprise architecture diagram for each division or major program area for completeness. Share the diagram with MIS to communicate the vision. Revise the diagram as necessary to incorporate changes to technology capabilities or solution opportunities.

TYPES OF ACTIVITIES

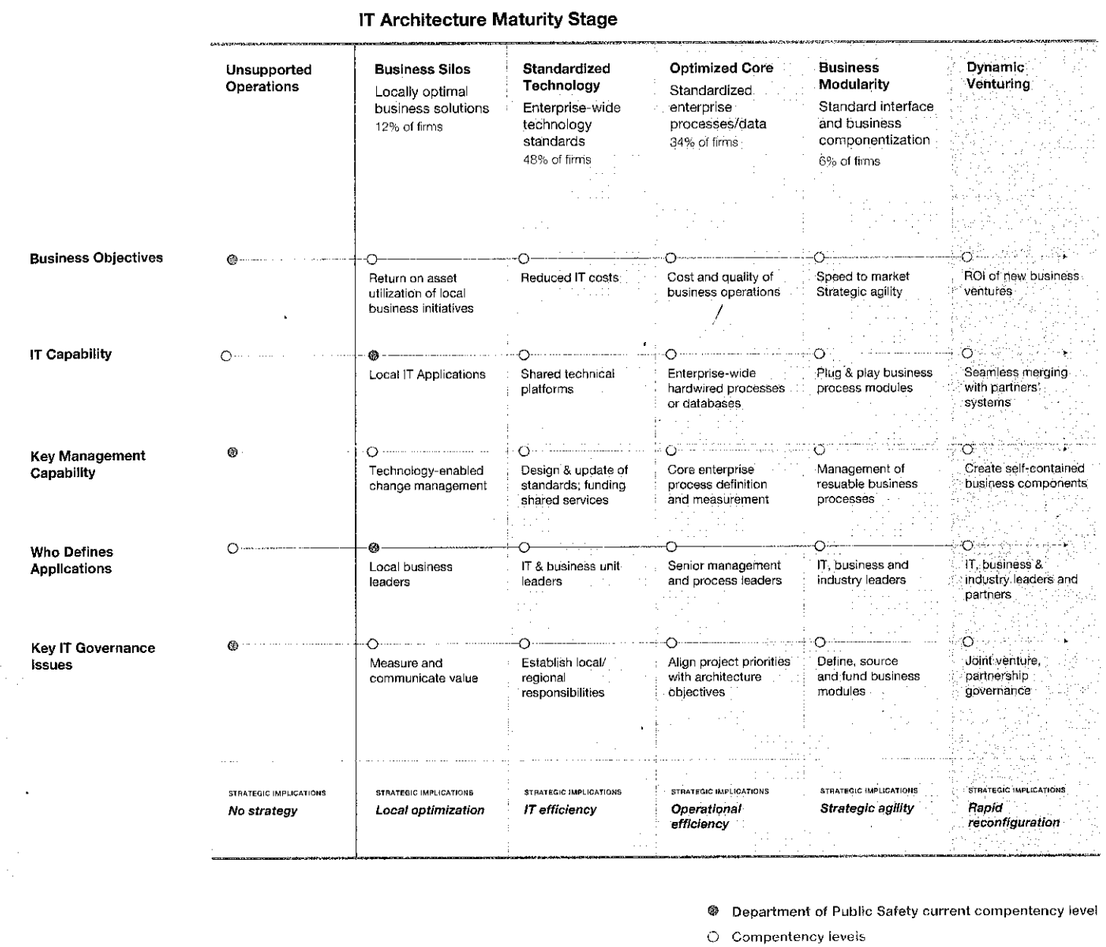
- ☐ Identify primary subgroups of operations and consider their working relationships (how their processes may be connected)
- ☐ Identify core operations processes
- ☐ Identify shared information between subgroups
- ☐ Identify necessary technology capabilities to facilitate these processes or information needs, consider whether process standardization is required or information flows need to be integrated
- ☐ Describe or model the information to clearly communicate with the department

RESOURCES/ REFERENCES

Possible Outcomes

See Appendix *IT Governance Framework — Strategy* (page 115) for information on the operational strategy and operating models. Appendix *Enterprise Architecture for the Department and Corrections* (pages 118 and 119) are examples for a perspective of how to envision operations in relation to IT.

fig. 7 The Learning Requirements of Each Stage



Blue dots indicate the current state of PSD's competencies. The largest gaps are in understanding the value of IT, using it to promote change and being able to measure and communicate the returns on IT investment. These are issues with executive strategy and administration. The areas of some competency is at the operations business-unit level. Some, but not all, of the department's operations are familiar with identifying operational needs and addressing them independently. Various staff have spearheaded local application improvements for their area. The changes are localized rather than coordinated and the technology tools are often not scalable.

Source: Enterprise Architecture as Strategy: Creating a Foundation for Business Execution, J. Ross, P. Weill, D. Robertson, Harvard Business School Press 2006.

REQUIREMENT:

Develop a culture of risk awareness

Create IT risk management processes such as communication channels and regular monitoring of all existing projects.

WHO IS RESPONSIBLE:

IT Governance Body

- *Director*
- *Deputy Director of Law Enforcement*
- *Deputy Director of Corrections*
- *Deputy Director of Administration*
- *Business Management Officer*
- *IT Officer*

TYPE OF ACTIVITY:

Direction

LEVEL OF DIFFICULTY:

High

Assigning new responsibilities, developing a new process, ongoing monitoring and enforcing compliance to attain desired behaviors.

BENEFIT TO THE DEPARTMENT: Individuals would feel encouraged that issues in their daily work will be resolved and that executives are engaged and interested in improving the work environment by reducing risk, addressing non-conformers, and running a tighter ship.

DESCRIPTION

Background information

A work culture that has an awareness of risks is able to identify, evaluate, communicate and address risks in a more timely manner than one that practices risk avoidance. Part of the success in developing a risk aware culture is that action needs to be taken to address the risk. This includes addressing non-conformers or managers that are increasing risk for the department.

FINDINGS

PSD's current situation

[redacted] The burden of communication is on the person who identifies a risk and there is no accountability with IT or management to take action or follow through on such feedback. If IT resources or funding prohibit an immediate response, there is no means to track these risks to ensure future resolution. This open feedback loop leads to minimal process improvements and an environment of high risk and no discussion. This is the same context in which ad-hoc solutions are built as individuals are left to manage issues on their own. Standard mechanisms for monitoring risks and taking action would start to change this behavior.

RECOMMENDATION

Possible ways to address the current situation

Evolve the MIS-supported stakeholder meetings to be focused on operations rather than specific applications. Each functional area may want to devote some time in their regular operations meetings to raise and discuss such risks. Executive leadership is required to make these discussions a priority and support these discussions by providing a process to gather these concerns and assign accountability among executives, management or administrators as appropriate. MIS participation in this assigning of responsibility is important to provide input on evaluating, assigning priority and identifying possible action or fixes. Consider appointing civilian staff roles or non-shift-based, non-appointed roles as point persons across facilities to provide consistency in managing IT-related concerns and allow for more rapid response. Have point persons collect IT, information and process needs, risks or concerns and provide a standard process for reporting to the IT governance body for review and discussion. They may also support the distribution of IT strategy communications and provide feedback on the status of the reported risks. Be prepared to handle situations of non-compliance and developing a process for managing personnel-related IT issues.

TYPES OF ACTIVITIES

- ☐ Review existing communication channels for monitoring and assessing processes across the department; address gaps
- ☐ Create a process for communicating IT (information, technology, process) risks from front-line to governance body
- ☐ Determine how to document, evaluate, and prioritize risks as needed
- ☐ Determine how to communicate back how issues are being managed
- ☐ Coach supervisors or point persons in the communication channel on how to receive risks that have been identified that support continued risk awareness and open communication

RESOURCES/ REFERENCES

Possible Outcomes

See Appendix *IT Governance Framework—Decisions* (page 117) to identify who may need to be involved in addressing the different kinds of risks in the formulation of a reporting/ communication process.

REQUIREMENT:

Develop an IT approval process

Create an IT project approval process with enforcement through education and training activities and corrective action for non-conformance.

WHO IS RESPONSIBLE:

IT Governance Body

- *Director*
- *Deputy Director of Law Enforcement*
- *Deputy Director of Corrections*
- *Deputy Director of Administration*
- *Business Management Officer*
- *IT Officer*

TYPE OF ACTIVITY:

Monitoring

LEVEL OF DIFFICULTY:

High

Requires development of a new process, communication and enforcement.

BENEFIT TO THE DEPARTMENT: A consistent IT investment approval process allows the department to have more oversight on how the department budget is spent. The information provides the basis for evaluating return on investment and return on asset utilization. Resources can be directed towards priorities and a means of IT control is able to be developed.

DESCRIPTION

Background information

Evaluating and reviewing all prospective IT projects allows for a means to ensure that projects that are approved are in alignment with business goals. Having a centralized process also enforces a culture of standardized operations. Requesting standard information helps to set a method for project planning. The information provided supports budgeting and prioritization activities. It enables discussions regarding return on IT investment and IT asset utilization as well as providing starting points for tracking IT projects overall.

FINDINGS

PSD's current situation

IT project planning is distributed and there is no centralized approval process. Many projects are handled from start to finish at the business-unit level. There is no single person aware of all IT projects within the department and there is no opportunity to provide strategic direction towards developing a cohesive infrastructure.

RECOMMENDATION

Possible ways to address the current situation

The Business Management Officer may want to work with the IT Officer or stand-in personnel to draft an approval process with input from the Deputy Directors and Director. Identify key criteria required for budgeting and evaluation purposes that include operational goals and technology expectations. Identify a default workflow and approval chain. Apply it to existing, open project plans and evaluate the process for feasibility, comprehensiveness and flexibility.

Continue to develop and refine the process as necessary, identifying exception cases, standards for evaluation and the like. Once an individual is placed in the IT Officer role and an enterprise architecture is designed for each of the main operating areas, it may be a process that is owned by the IT Officer with final approvals provided by the IT Governance Body.

TYPES OF ACTIVITIES

- ☐ Review existing approval processes for framework
- ☐ Identify key information requirements
- ☐ Identify process measures
- ☐ Identify tracking requirements and process accountabilities
- ☐ Determine process for review and approval with the IT Governance Body

RESOURCES/ REFERENCES

See Appendix *IT Governance Framework* (pages 115-117) for information on IT Governance Body meeting output that includes operational goals, performance goals, and individuals to involve for input and decision-making.

REQUIREMENT:

Set IT performance goals

Clearly articulate goals for the performance of IT services in support of the Department's delivery on its operational strategies and performance goals.

WHO IS RESPONSIBLE:

IT Officer

TYPE OF ACTIVITY:

Monitoring

LEVEL OF DIFFICULTY:

Moderate

Primarily a decision-making activity with some process planning.

BENEFIT TO THE DEPARTMENT: IT is more focused and accountable for the delivery of services. The rest of the department would be more aware of IT's ability to facilitate process improvement.

DESCRIPTION

Background information

IT is an enabler of change that requires direction and monitoring to fully maximize its capabilities. IT performance goals are the means for setting clear expectations for what IT should do to support the performance goals of the Department. This is different than the role of IT as it focuses on measurable outcomes rather than strategic purpose.

FINDINGS

PSD's current situation

MIS lacks strategic focus and clarity of performance requirements. Through the DIIP IT governance body meetings, a department goal of "develop an engaged and well-trained workforce through the integration of best practices" was identified but final decisions on performance measures were not set. [redacted]

While having exact department measures would be preferable, this is sufficient for considering the IT performance required. There are some existing measures for individual processes such as for managing open help-desk tickets, but these do not address the alignment of IT performance with department performance.

RECOMMENDATION

Possible ways to address the current situation

Identify a handful of goals that best direct IT performance in meeting the needs of the department. It may be best to start with fewer goals as this is a new practice for the department and clearer focus may desirable at this stage. Similarly, identifying easily measurable attributes for these goals may be preferred so that complexity of tracking does not distract or dissuade individuals from taking action.

TYPES OF ACTIVITIES

- ☐ Review the Operational Goals, Department Performance Goals and the Role of IT and identify the goals that are most important for IT performance in meeting the needs of the Department
- ☐ Identify potential measures
- ☐ Determine how to best track the measures
- ☐ Identify accountabilities and process for tracking and review

RESOURCES/ REFERENCES

See Appendix *IT Governance Framework—Goals* (page116) for examples of potential IT performance goals

REQUIREMENT:

Define IT costs and services

Define and communicate IT capabilities, levels of service and costs associated with MIS services.

WHO IS RESPONSIBLE:

IT Officer

TYPE OF ACTIVITY:

Monitoring

LEVEL OF DIFFICULTY:

High

Requires research, evaluation, possible reorganization or position changes in addition to the development of a new processes for procuring services.

BENEFIT TO THE DEPARTMENT: The department would be more aware and able to articulate IT project needs with greater specificity regarding the kinds of services and the level of service required. Estimating IT project needs would improve and expectations for services from MIS would be more realistic. The department's IT capabilities gap would be quantifiable. The department would be better able to assess vendor costs for IT services.

DESCRIPTION

Background information

Clarifying the role and value of IT is made more tangible by communicating the costs of the services provided. By defining and tracking service costs, the department would be better able to assess return on investment and plan for future needs.

FINDINGS

PSD's current situation

IT service agreements are managed directly by the business units rather than through a centralized function. MIS currently serves as one IT service provider for the department yet does not track the services provided to the different business units in the department. Business units may not involve MIS in the planning of their projects and do not recognize the resource requirements to support their solutions. [redacted]

RECOMMENDATION

Possible ways to address the current situation

In defining the role of IT, determine what the expected capabilities will be for MIS (see "Define the role of IT") and what will be a contracted service. Work with the Business Management Officer and MIS manager to breakdown MIS budgeted activities and current services to develop cost estimates for services or resource usage. Some recommended means of communicating these costs and services are through the creation and usage of service-level agreements (SLA) and chargebacks. These establish clarity for what kinds of services are being provided and the cost of those services for both business units requesting services and MIS.

A **Service-Level Agreement** is a commitment between a service provider and a client. Particular aspects of the service—quality, availability, responsibilities—are agreed between the service provider and the service user.[1] The most common component of SLA is that the services should be provided to the customer as agreed upon in the contract... Two different units in an organization script a SLA with one unit being the customer and another being the service provider. This practice helps to maintain the same quality of service amongst different units in the organization and also across multiple locations of the organization. This internal scripting of SLA also helps to compare the quality of service between an in-house department and an external service provider.

Wikipedia: "service-level agreement," retrieved Jan 9, 2019.

Chargebacks The need to understand the components of the costs of IT, and to fund the IT organization in the face of unexpected demands from user departments, led to the development of chargeback mechanisms, in which a requesting department gets an internal bill (or "cross-charge") for the costs that are directly associated to the infrastructure, data transfer, application licenses, training, etc., which they generate. The purpose of chargeback includes:

- Making departments responsible in their usage, e.g., refrain from asking for resources they are not going to use
- Providing visibility to the head of IT and to senior management on the reasons behind the costs of IT
- Allowing the IT department to respond to unexpected customer demand by saying "yes, we can do it, but you will have to pay for it" instead of saying "no, we cannot do this because it's not in the budget."

Wikipedia: "IT chargeback," retrieved Jan 9, 2019.

TYPES OF ACTIVITIES

- ☐ Assess current project assignments for service requirements, support levels, resource needs and estimate time and cost
- ☐ Meet with business unit project owners and define expectations for those projects to include metrics on responsiveness and accountabilities for risk management
- ☐ Consider restructuring work assignments as necessary to best fit the needs of the department
- ☐ Communicate the defined capabilities of MIS along with estimated costs to the department for budgeting purposes

RESOURCES/ REFERENCES

Possible Outcomes

See Appendix *Enterprise Architecture for the Department and Corrections* (pages 118 and 119) to help identify where and what kind of IT services are currently in use or have been used.

REQUIREMENT:

Track projects

Centralize IT project information for the department

WHO IS RESPONSIBLE:

IT Officer

TYPE OF ACTIVITY:

Monitoring

LEVEL OF DIFFICULTY:

Moderate

Familiarity with required information and tasks. Need to develop process and accountability.

BENEFIT TO THE DEPARTMENT: IT project status and IT resource usage would be better understood. Risks could be surfaced earlier as projects are continuously monitored. Program and project planning can be more informed. ETS and the legislature would be able to recognize the Department's efforts at managing IT resources.

DESCRIPTION

Background information

Ongoing projects need to be tracked in order for governance and management activities to be performed. Projects should be tracked for open/closed status, trajectory (progress direction and rate), accountabilities or resource assignments, open actions, needs and risks. The information should be consistently updated and centrally managed such that it is easy to evaluate, compare and assemble program requirements for the department.

FINDINGS

PSD's current situation

[redacted] The state requested information for their IT dashboard but the information was gathered as a one-time activity, was incomplete and had not been updated to reflect changes.

RECOMMENDATION

Possible ways to address the current situation

The types of information requested by ETS would be appropriate. The ETS dashboard itself can be updated/used as is most convenient. According to the ETS website, the SharpCloud tool is required so it may be in the best interest of the department to learn how to use it and update it periodically as expected by ETS. Develop this as a responsibility for the IT Officer or delegate it to someone within MIS. Ensure regular updates by creating a process for tracking project details throughout the department.

TYPES OF ACTIVITIES

- ☐ Gather information on existing projects from around the department
- ☐ Update the tracking system whether it be Excel, the ETS dashboard tool, or something else
- ☐ Set a standard process for how to keep information up-to-date

RESOURCES/ REFERENCES

Find information on the State's IT roadmap at http://ets.hawaii.gov/governance/it-governance-forms/it-budget-and-spend-request-cycle/it-roadmapping/

REQUIREMENT:

Evaluate business value

Develop a services assessment process for regular evaluation and adjustment in the monitoring of IT services.

WHO IS RESPONSIBLE:
IT Officer

TYPE OF ACTIVITY:
Monitoring

LEVEL OF DIFFICULTY:
Moderate
Developing a new process.

BENEFIT TO THE DEPARTMENT: Delivery of IT services would be held to meaningful standards. Expectations could be made clear for the department. Gaps in service delivery or new service needs would be readily identified and the department can choose to be proactive in meeting changing needs. Management would also have an opportunity to be more engaged in supporting IT operations by helping to communicate more realistic expectations where demands outsize the capabilities.

DESCRIPTION
Background information

Understanding and evaluating return on investment is a necessary first step towards making informed IT decisions. Business value is the evaluation of the return on investment determined by the quality of outcomes. Consumers of the IT service would need to provide feedback that evaluates the performance of service in relation to their expectations for service. The information can be used to both adjust the services to better meet expectations or adjust expectations to better meet realistic service capabilities. This is a process of alignment and develops the organization's practical capability to evaluate IT services.

FINDINGS
PSD's current situation

[redacted] Without oversight from a governance body or executive-level management, any discrepancies between service expectations and delivery have no opportunity to be addressed.

RECOMMENDATION
Possible ways to address the current situation

Start by developing a simple customer feedback survey and determine a process and accountabilities for tracking, review and feedback.

TYPES OF ACTIVITIES

- ☐ Identify appropriate measures for evaluating service delivery
- ☐ Determine when an evaluation should be given to a customer of IT services (MIS or contract vendor)
- ☐ Determine process and standards for evaluation
- ☐ Determine process for corrective action
- ☐ Determine monitoring process

RESOURCES/ REFERENCES

See Appendix *IT Governance Framework —Goals* (page 116) for some starting considerations of performance expectations and evaluation

This is not an era of static technology anymore. This is an era where the only thing static is change. That's the only constant. So the idea of buying single, proprietary bespoke systems for agencies is also giving way to an era of software-as-a-service, power by the hour, cloud provisioning. That's really shaking the business models of a lot of the companies.

— Dan Tangherlini, former Administrator of the General Services Administration, 2016

3

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IT Operations and Management

Findings, insights, recommendations and requirements that pertain to **IT managerial** action.

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+ IT Stagnancy
+ Core Competencies:
    - Project planning
    - Project management
    - Data management
    - Technology management
    - Technical support
    - IT training for the department

IT Stagnancy

The Department's IT capabilities and software applications lag behind modern workplace expectations.

[redacted]

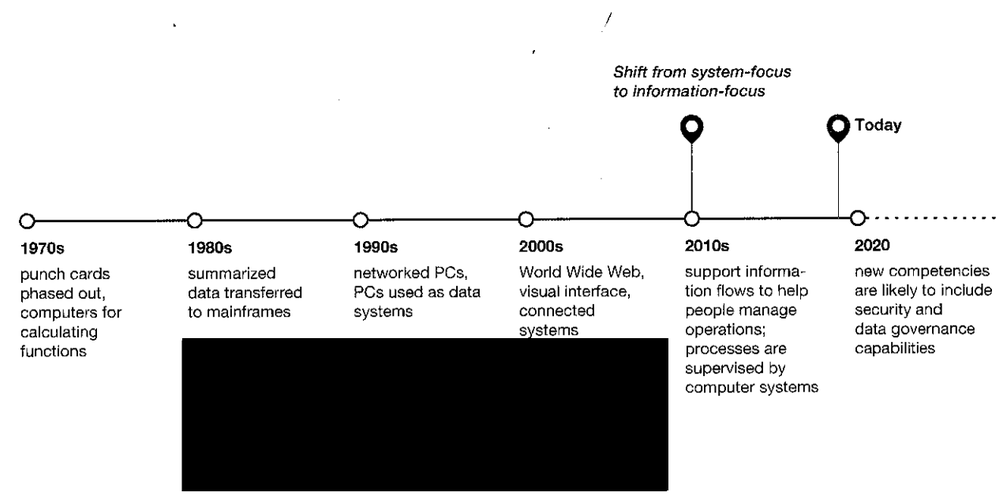
[redacted] This stagnancy is largely due to a lack of IT strategy with little direction for evolving the role and purpose of technology use in the department. More modern IT operations require new capabilities to support the increased IT service expectations and operational needs.

Core Competencies

The primary concern for IT operations is that the baseline IT support services are already insufficient for department needs. In light of the desire for a corrections system replacement, this raises three specific risks.

The first is the inability to provide technical input to support project planning, technical requirements communication, vendor evaluation and project support. While there may be some technical competence, the department has not been involved with the project proposal and planning stages of most of the department's software projects. Business-unit and division administrators are more familiar with

fig. 8 **The changing role of MIS and where PSD's IT capabilities fall**



[redacted]

Based on information from: http://www.inc.com/encyclopedia/management-information-systems-mis.html

[redacted]

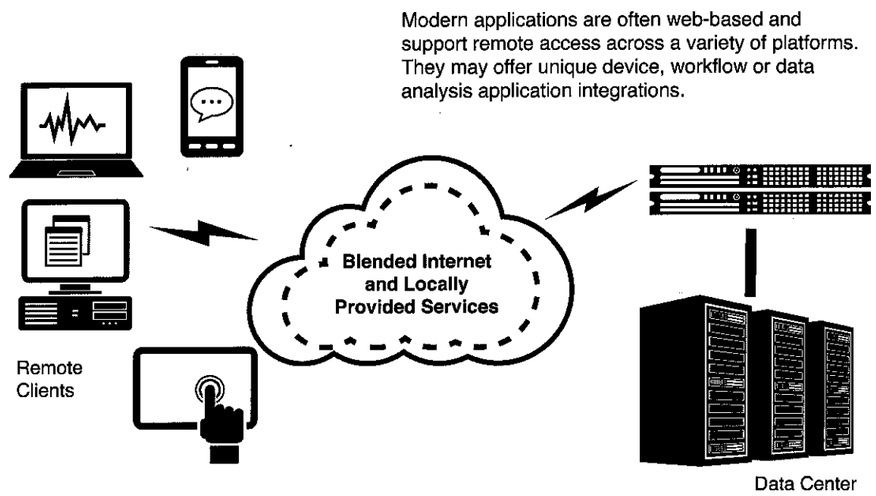


fig. 9 **Comparing systems from the late 1990s and 2010s**

Comparing late-1990s systems with a 2010s system demonstrates the increased number of variables that may be part of a successful implementation and the necessary breadth of skills.

the process of project planning but lack the technical competency for requirements communication and vendor evaluation. This unpracticed skill and previous lack of accountability leaves uncertain that requirements are communicated in the RFP, that vendors will be evaluated with respect to PSD's IT strategy and that software design concepts are rigorously tested for all use cases.

Secondly, bringing in more modern software tools will require significant changes to operations use of technology, and consequently, increased use and new demands of IT support services. [redacted]

The priority action is to increase IT core competencies and capabilities that may be achievable through staff position reevaluation/reassignments, training and hiring. Partnering with vendors to provide additional support remains an option. But this is another competency which must be built.

Finally, two of the competencies that are particularly important for bridging the strategy and operations gap are the "Product and delivery" roles of business analyst and program delivery manager. *(See figure 10 on the next page.)* While there are presently persons that are considered to be performing business analyst roles, the current expectations for the role are insufficient and therefore identified as a skills gap. Both business analyst and program delivery manager roles are necessary for project planning and project management capabilities throughout a project lifecycle. These roles would serve as critical liaisons with a vendor for a vendor-managed software project and would work closely with the IT Officer on an ongoing basis.

The following diagram compares the department's current capabilities to it's required capabilities and future needs. The resolution of all issues will require executive direction to first define the role of IT for PSD, define MIS' specific role, identify where it may be necessary to distribute IT-related responsibilities with other business units or outsource services. The IT Officer role should then provide direction on prioritization, specifying the details of change, and defining measures for ongoing performance evaluation. [redacted] The following list is directed to the IT Officer, IT Governance Body, and IT Manager for management action.

fig. 10
The Digital, Data and Technology Capability Framework

The Digital, Data and Technology Capability Framework created by the United Kingdom's Digital Services here provides an example of the range of skills that may be included in a government IT organization.

We have indicated the types of services currently supported and what would be required for baseline service expectations.

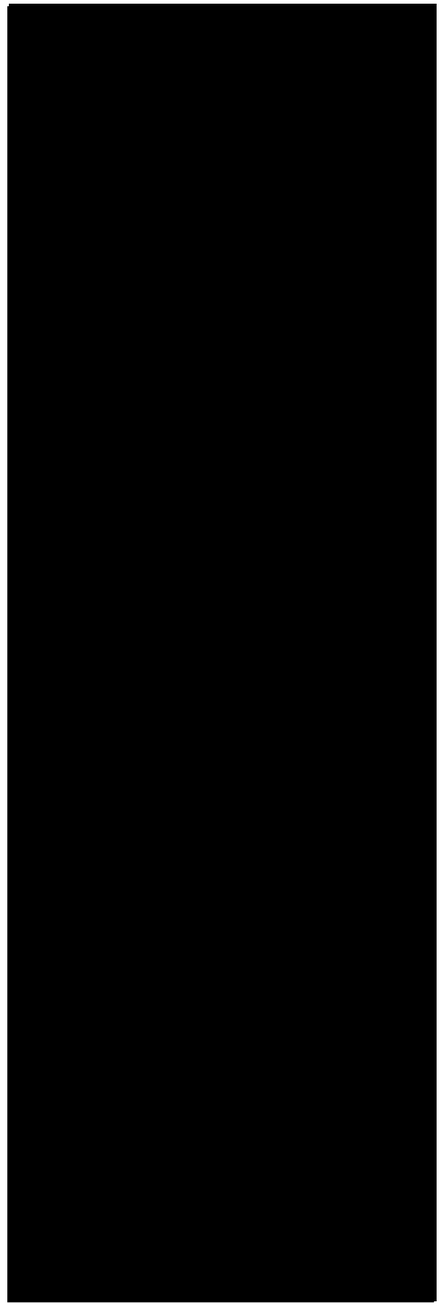
These indicate capabilities and do not necessarily represent individual positions. It would be possible to have one person serve in multiple capacities. Similarly, there may be areas in which more than one individual would be needed to provide adequate bandwidth of service.

We have included descriptions of the highlighted roles in the IT Operations Appendix. For information such as skills, levels, see the Gov.uk website.

See website for skills levels and descriptions for each of the roles.

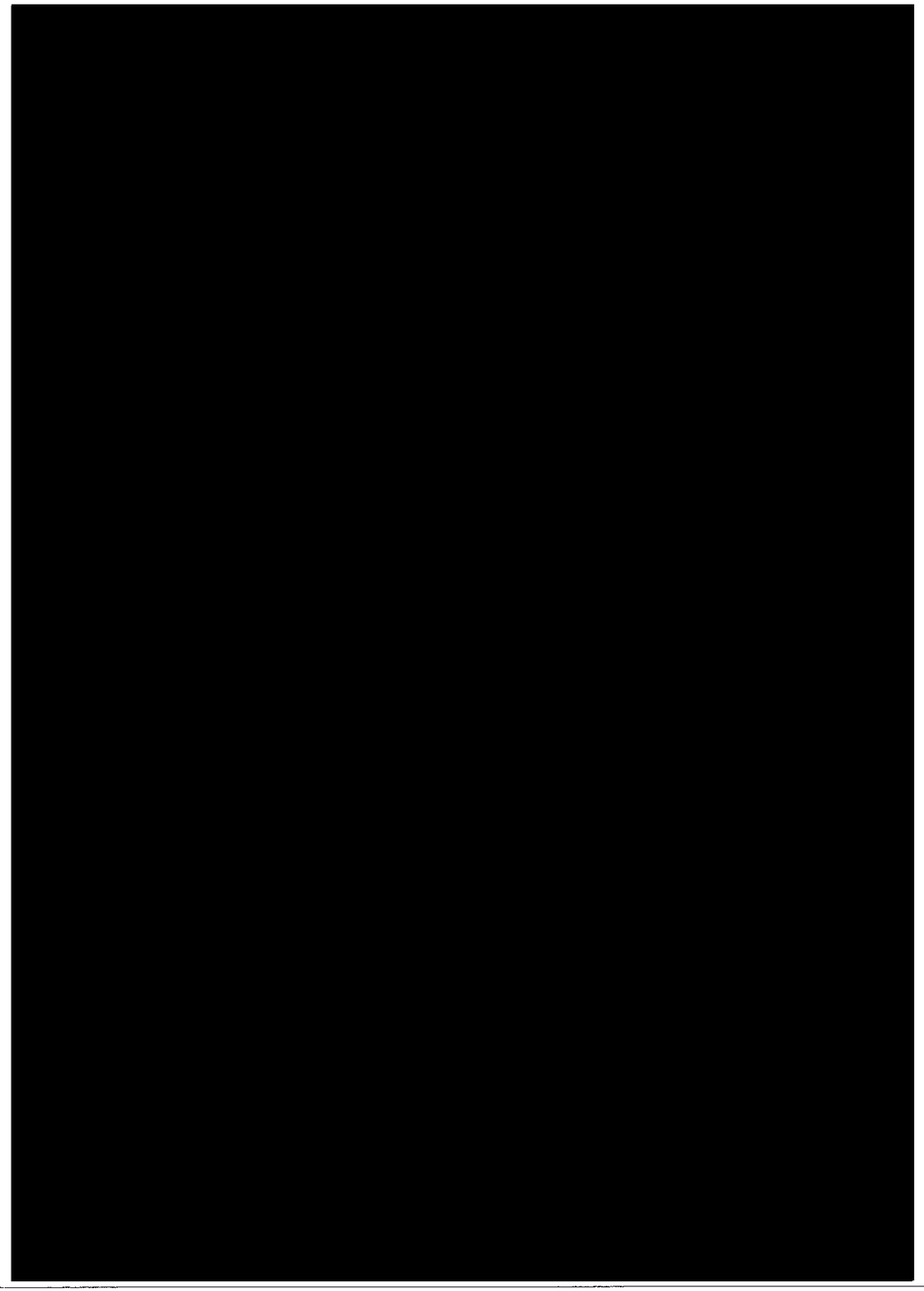
From: https://www.gov.uk/government/collections/digital-data-and-technology-job-roles-in-government

PSD's current IT capabilities:
(in black)



PSD needs these IT capabilities:
(in blue)

PSD needs these IT capabilities if building software
(in green)



You can improve your IT operations through staff position reevaluation/ reassignments, training and hiring.

What IT core competencies and capabilities do you need?*

You should focus on these core competencies for your IT operations:

- ☐ Project planning
- ☐ Project management
- ☐ Data management
- ☐ Technology management
- ☐ Technical support
- ☐ IT training for the department

* Prerequisite work from *Section 2: IT Strategy* includes:

- *Define the role of IT in the Department of Public Safety*
- *Define the role of MIS in the Department of Public Safety*
- *Identify where it may be necessary to distribute IT-related responsibilities with other business units or outsource services.*
- *The IT Officer role should then provide direction on prioritization, specifying the details of change, and defining measures for ongoing performance evaluation.*

IT CORE COMPETENCY

Project planning

WHO IS RESPONSIBLE TO ENSURE COMPETENCY IS MET

IT Officer
IT Governance Body
IT Manager

WHAT THIS LOOKS LIKE

Project planning often starts after a business need and project opportunity have been identified. The primary activities are analysis of projected task requirements and risks to determine scope, methods and resource needs. This activity is used towards drafting a project proposal as it provides sufficient detail for evaluation and approval. For the Department, project planning would need to be a paired activity between a process owner with deep understanding of the operational goals, needs and constraints; and an IT role, most likely a business analyst, who has deep understanding of the IT strategy, enterprise architecture, and IT capabilities and constraints. This is a role that is sometimes housed outside of IT operations in a separate project management office.

FINDINGS

PSD's current situation

IT operations in the department are disconnected from other operations activities such that Department needs are not reviewed by IT/business analysts for technology implementation opportunities, input, or planning. [redacted] Efforts do not align with strategic goals and are reactive to operational challenges that are perceived as discretely managed within the business unit. [redacted] In total, implementations are built that unintentionally reinforce process silos and a task-oriented mindset.

IT CORE COMPETENCY

Project management

WHO IS RESPONSIBLE TO ENSURE COMPETENCY IS MET

IT Officer
IT Governance Body
IT Manager

WHAT THIS LOOKS LIKE

Project management often starts once project approvals are in progress to transition from project planning to management. Project managers often use the project plan as the guideline for how the project should be executed. They are responsible for managing the execution of project tasks to ensure meeting of goals that may include direction, monitoring, evaluation, communication, planning and feedback. While it is a role that is sometimes outsourced for software projects, it is essential to perform this responsibility in-house, specifically for specialized functions (like corrections and law enforcement) due to required inside knowledge of department operations, including goals, stakeholders, influencers, processes, culture, and risks, and the improved communications that come from well-developed working relationships.

FINDINGS
PSD's current situation

IT operations are not sized or equipped to handle the department's needs and therefore IT is [redacted] operations do not adhere to the project lifecycle or the level of engagement and follow-through required to meet necessary delivery of products and services or the continuous evaluation of performance and goals.

IT CORE COMPETENCY

Data management

WHO IS RESPONSIBLE TO ENSURE COMPETENCY IS MET

IT Officer
IT Governance Body
IT Manager

WHAT THIS LOOKS LIKE

Data management is typically based on policies, standards and regulation depending on the type of data and use cases. It requires executive decisions in areas such as data ownership, sharing, and terms and conditions of use. Decisions at the application level are often made based on best practices and security considerations are often the starting point.

FINDINGS
PSD's current situation

[redacted]

[redacted]

There is also little oversight or engagement with the department data to consider opportunities for improvement such as through increased data access, integration or consideration of a data pipeline that extracts data from various sources to make them available to users.

IT CORE COMPETENCY

Technology management

WHO IS RESPONSIBLE TO ENSURE COMPETENCY IS MET

IT Officer
IT Governance Body
IT Manager

WHAT THIS LOOKS LIKE

Technology management is the planning, tracking and monitoring of the software applications, hardware and networking equipment and resources. The purpose of the management activity is to be aware of the status of operational needs and risks in relation to existing assets and services in order to make a determination for action. The responsibility of management is based on operating models as the level of standardization and organizational needs determine where technology decisions are made and projects are tracked. Desire for more structure and standardization often requires more centralized processes.

FINDINGS

PSD's current situation

Without operating models or a clear decision on how IT should be managed, technology status is inconsistent and not well-managed throughout the department. Technologies are managed at the individual-level to the business-unit-level in many cases. Other solutions that are more standardized may be owned and managed at a facility or division level.

The issue starts with the lack of a clear enterprise architecture. [redacted] Operational needs should take priority but often needs are downgraded if there are any external challenges to implementation that require additional work. For example, appropriate technology implementation may require changes to physical space, licensing agreements, software changes or process change agreements with another functional area. In these cases, the discussion may end as there is no ownership for addressing these additional challenges. This is true of both hardware and software implementations. [redacted]

[redacted]

[redacted]

The current IT systems are designed to minimize risks for IT operations rather than for department operations. This tradeoff results in impaired operational performance. [redacted] Without redefining the role of IT, IT operations may continue to be unaccountable for engaging with operations to develop and maintain capabilities.

IT CORE COMPETENCY

Technical support

WHO IS RESPONSIBLE TO ENSURE COMPETENCY IS MET

IT Officer
IT Governance Body
IT Manager

WHAT THIS LOOKS LIKE

IT services often provide a means for providing help regarding shared tools and services and general operability concerns for managed services. Service may be provided by phone, over email, via the web or using specific software to log an incident, or in person.

FINDINGS
PSD's current situation

MIS operates with a lack of clarity of how and when to provide support due to the ambiguity of the role of IT and ambiguous expectations of service for vendor applications. Support requests are managed only when it is clearly within MIS's known scope. Otherwise, requests are openly rejected without providing guidance on how to proceed.

[redacted]

[redacted]

Lack of executive engagement has provided some of this context as the role of IT and service level have not been explicitly stated to prioritize continuity of service for daily operations.

IT CORE COMPETENCY

IT training for the department

WHO IS RESPONSIBLE TO ENSURE COMPETENCY IS MET

IT Officer
IT Governance Body
IT Manager

WHAT THIS LOOKS LIKE

Technology training and skill development are required for professional development across the department and are necessary for both custom applications used on the job and general office application proficiency.

FINDINGS
PSD's current situation

Minimal training is provided by IT through the Training Services Division and custom applications are assumed to be the responsibility of the facility or division to coordinate and manage. [redacted] Training for many individuals is strictly on-the-job. In some cases, there are super-users on site who are able to help demonstrate tasks but this is often performed on a by-need basis.

[redacted]

Accountability for IT training must be established.

The system disables performance.
For most managers this is hard to see.
What they see is people 'behaving badly'.

— John Seddon: British occupational psychologist and author, specialising in change in the service industry (from Wikipedia)

4

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Corrections Processes

Findings, insights, recommendations and requirements that pertain to **Corrections** action in the context of software replacement opportunities.

—

+ Unsupported by IT
+ Corrections' Core Objectives
+ Process Capability Assessment
+ Security Processes
    - Communicating eisk (low to high) and urgency
    - Evaluating custody-specific risk level (danger/threat)
    - Identifying sustodies
    - Locating sustodies and transferring information
    - Checking risk for non-custodies—personnel, volunteers, visitors
+ Professional Accountability
    - Performing legal calculations—time served/sentences/release date/restitution
    - Executing judicial orders
    - Addressing risk/needs (identifying and meeting)
    - Documenting validated data
    - Managing PSD-custody communications

Unsupported by IT

The biggest missed opportunity for corrections operations is not leveraging technology. The fragmented data infrastructure has left operations workflows without central management. And the lack of IT management provides no opportunity for resolution with the development of a better, more cohesive data infrastructure.

Unsupported processes turn a single task into a convoluted process [redacted] There is so much work, in terms of mental overhead and manual processes, for so little payoff. By comparison, processes that are supported by technology tools are much faster with most of the actions being completed within a single application. However, even these tasks are more tedious than desired as the applications are older in design and not built for known workflows. The interfaces are unintuitive and require the application user to click through numerous screens to isolate the fields necessary to advance their task process. In other cases, the application has not been adequately customized and the user is required to use workarounds within the application to complete their task.

Performing information-related tasks is a significant burden for many of the corrections staff, from records and the business office to case management and security personnel. Adding to this is the fact that most of this work is policy driven with real deadlines and consequences. The work is tedious, stressful and seemingly never-ending. [redacted] The sense of fatigue and burnout were tangible in some staff and others were tireless but cognizant of the definite need for improvement.

This lack of support is not specific to Corrections but Corrections appears to be the hardest hit. Corrections has numerous policies and procedures that require formal documentation for the performance of day-to-day operations. Considering increases in the custody population and low staffing increases (or as we saw, cuts in staffing), civilian staff will only become more overworked and security staff may be required to perform an increasing amount of clerical work.

[redacted]

Corrections requires more IT support.

Corrections' Core Objectives

IT implementations need to address core objectives in order to successfully support operations. These objectives provide base assumptions for how operations should be run and why and provide a foundation upon which software design requirements can be built. They should also align with department operational and performance goals.

From the IT Governance Body discussions, Corrections IT strategy is to:

- follow a "coordination" operating model;
- run safe, secure, and humane operations as its operational strategy; and
- set performance goals of integrating best practices to reduce disciplinary actions and develop an engaged and well-trained workforce.

Based on these goals, we identified the following two core objectives for IT use in corrections operations.

PRIORITIZE SAFETY AND SECURITY

Corrections processes are perceived first and foremost as security processes. Whether the goal is rehabilitation or separation from society, the primary framework for operations is in providing a safe environment, free from danger or threat. This goal is the baseline requirement regardless of the specific corrections process; it is pertinent to providing education services, case management or mail screening and relevant to personnel, custodies, volunteers, the community — any and all individuals as they relate to the corrections system.

Safety and security depends on personnel training and preparedness, as well as setting up secure processes and environments. It also entails timely access to information, accurate assessments and appropriate tools and spaces to complete necessary tasks. Information and digital data are used more for documentation purposes and less for managing timely and appropriate action. Understanding how information should be used to support the security and safety of operations is a priority.

DEVELOP AND SUPPORT PROFESSIONAL ACCOUNTABILITY

The second priority for corrections processes is to demonstrate professional accountability. Corrections Division documentation activities exist as a type of evidence — information to help depict a context, confirm an action, and provide rationale for judgments and activities. This requirement pertains to all corrections actions regarding the handling of information, people, places and services that comprise corrections operations. Professional accountability is what is required to meet the department mission of providing services with professionalism, integrity and fairness and ensure that the operational strategy is being met. Information systems can be made to encourage and enforce best practices and monitor processes for accountability.

Process Capability Assessment

From this basis, we selected the core capabilities that we considered to be critical for corrections operations and listed them in descending order of priority. They are synthesized from administrative and facilities research and evaluated based on what staff is currently doing, what they want to be able to do, and what would be required to meet the two core objectives of prioritizing safety and security, and developing professional accountability.

We recommend that Corrections administrators define and standardize these following capabilities ahead of embarking on any technology project. It will help to define the division's key needs and will likely be among the functional requirements across multiple projects.

We have provided questions as probes to help you evaluate what you may want to specify in redesigning your processes. All prioritization, requirements and recommendations are offered as suggestions for your consideration.

We have evaluated the existing processes according to the **COBIT 5 framework, Process Capability Levels** to help convey the state of current processes and the relative amount of work required to create a standardized process. The levels are as follows:

LEVEL 0: Incomplete
The process is not implemented or fails to achieve its purpose

LEVEL 1: Performed
Process is performed and informed. The process is implemented and achieves its purpose.

LEVEL 2: Managed
Planned and monitored performance and work product. The process is managed and results are specified, controlled and maintained

LEVEL 3: Established
Process is well-defined and deployed. A standard process is defined and used throughout the organization

LEVEL 4: Predictable
Process is measured and controlled quantitatively. The process is executed consistently within defined limits

LEVEL 5: Optimizing
Process is continuously improving in innovative ways and being optimized. The process is continuously improved to meet relevant current and projected business goals.

Based on the department's present digital maturity stage, the expectation is that most processes are somewhere between a level 0 to 2. A well-managed standardized process, would be a 2 if handled as a separate process and a 3 if designed into a cohesive information system. The higher levels are typical of more mature organizations with control processes, auditing, and an infrastructure built to a well-developed enterprise architecture. More details on how these levels factor into a software replacement project is explained in the following section.

To meet your primary goals of "Safety & Security" and "Professional Accountability" what core capabilities are most critical to your corrections operations?

Corrections administrators should define and standardize these core capabilities before embarking on any IT project.

For Safety & Security:

- Communicating risk (low to high) and urgency
- Evaluating custody-specific risk level (danger/threat)
- Identifying custodies
- Locating custodies and transferring information
- Checking risk for non-custodies — personnel, volunteers, visitors

For Professional Accountability:

- Performing legal calculations — time served/sentences/release date/restitution
- Executing judicial orders
- Addressing risk/needs (identifying and meeting)
- Documenting validated data
- Managing PSD-custody communications

CORE CAPABILITY:

Communicating risk (low to high) and urgency

GOAL:

Safety & Security

STAKEHOLDERS:

- Corrections facility administrators
- Program/branch administrators
- Law Enforcement administrators
- Non-PSD program administrators that deliver custody services

CURRENT CAPABILITY LEVEL:

[redacted]

DESCRIPTION

Background information

Corrections is inherently a high risk environment and corrections staff require timely awareness to allow them to make decisions on how to manage resources, take appropriate action or control the environment. Immediate or emerging risks must be differentiated from general, less urgent concerns to prevent untimely action or non-action. This pertains to communications with personnel such as ISC, Corrections security, health care, Sheriff's deputies and HPD.

There may be requirements for documentation which are a separate, secondary need from the primary need for timely and appropriate communication. The means of communication should match the risk-urgency level and take into consideration the recipient of the message and the context of their operations. For example a high risk, high urgency communication provided as a [redacted] may be just as inappropriate as an email depending on the recipient. Both will require unprompted action from the recipient to check for any messages. Use of radios and other systems may be more appropriate in high risk, high urgency communications however, issues with broadcasting security risk information in an environment with custodies must be considered as well.

FINDINGS

PSD's current situation

[redacted]

FINDINGS *continued*

[redacted]

EXAMPLES

[redacted]

CLARIFYING QUESTIONS

[redacted]

CORE CAPABILITY:

Evaluating custody-specific risk level (danger/threat)

GOAL:

Safety & Security

STAKEHOLDERS:

- ISC
- RAD
- Case Managers Supervisors
- Reentry Office
- Program/Branch Administrators
- Health Care
- PREA Administrators
- Security — STG, Investigations, Housing, Mail, Visitation
- Non-PSD Program Providers

CURRENT CAPABILITY LEVEL:

[redacted]

DESCRIPTION

Background information

Custody risk information requires evaluation to determine individual custody management needs. This type of information is common to functions such as ISC, security, case management, classifications, and program managers (for substance abuse or sex offender treatment). It may also include information from mail and visitation screening to update social relationships or security concerns identified in their screening processes. Decisions made using such data include housing, placements or other enrollment actions where danger or threats to a custody or other individuals is of concern.

Some requirements include providing information sources and date/time of last update to ensure that information is still relevant. Documenting decisions and the reason for those decisions are required as there should be allowances for auditing of the process, and checks and balances to ensure there are no undesirable patterns.

Data may be useful for data analysis (such as looking for a single incident versus multiple incident patterns, or a behavioral pattern as a result of a trigger event or issue, or assessing other inherent risks), and to determine consistency of decision-making in general.

Policy and procedures would set transparency standards and documentation requirements, especially in cases of exception handling.

FINDINGS

PSD's current situation

[redacted]

EXAMPLES

[redacted]

CLARIFYING QUESTIONS

[redacted]

CORE CAPABILITY:

Identifying custodies

GOAL:

Safety & Security

STAKEHOLDERS:

- Security — Intake, ID Processing, Booking, Housing, Transport, Movements, Transfer, Release
- Service providers

CURRENT CAPABILITY LEVEL:

[redacted]

DESCRIPTION

Background information

Identifying an individual in-person or in a database sounds straightforward but in the context of corrections, it is quite complicated. Identification is about the proper association of a set of attributes, affiliations and history with the right physical person. Ideally, one person should be trackable across entries, facilities, databases and identifiable at any given time to ensure that they are managed appropriately.

FINDINGS

PSD's current situation

[redacted]

EXAMPLES

[redacted]

CLARIFYING QUESTIONS

[redacted]

CORE CAPABILITY:

Locating custodies and transferring information

GOAL:

Safety & Security

STAKEHOLDERS:

- Security — Housing, Transport, Movements, Transfer, Release
- Service providers

CURRENT CAPABILITY LEVEL:

[redacted]

DESCRIPTION

Background information

[redacted] Knowing the location of a custody and their purpose for their being there is a key aspects of maintaining security. Location information is also required to provide general services. Excellent communication and coordination is required. [redacted]

FINDINGS

PSD's current situation

[redacted]

EXAMPLES

[redacted]

CLARIFYING QUESTIONS

[redacted]

CORE CAPABILITY:

Checking risk for non-custodies — personnel, volunteers, visitors

GOAL:

Safety & Security

STAKEHOLDERS:

- HR, Programs
- Case Managers
- Security — Mailroom, Visitation, Release, Housing

CURRENT CAPABILITY LEVEL:

[redacted]

DESCRIPTION

Background information

Verifying that the custody is only in contact with authorized individuals is essential. Processing employees and contracted service providers must be an established process. Volunteers and contractors that work with custodies or facilities should also be cleared through standard procedures. Custody communications should be in compliance with victim needs and not endanger themselves, the community within the facility or the public through unauthorized communications. Visitors and mail correspondence must be in compliance. List of approved individuals/relationships must be continuously updated.

FINDINGS

PSD's current situation

[redacted]

EXAMPLES

[redacted]

CLARIFYING QUESTIONS

[redacted]

CORE CAPABILITY:

Performing legal calculations — time served/sentences/release date/ restitution

GOAL:

Professional Accountability

CURRENT CAPABILITY LEVEL:

[redacted]

STAKEHOLDERS:

- Records
- Security Intake
- Sheriff Division
- Business Office

DESCRIPTION

Background information

Corrections is responsible for calculating time served across police and court detainment facilities in addition to jails and prisons. Corrections assumes responsibility for interpreting court documents and calculating sentences according to laws of the present time (concurrent versus consecutive sentencing) to determine release dates. Information is gathered from multiple sources to make these determinations and there is little means for validating that all sources were checked and that all data available was up-to-date. Calculations for short sentences require immediate attention and timeliness of performance. Pre-sentence calculations can be challenging as there may be many ins and outs to account for. These tasks are often distributed between records staff and security officers. As incorrect calculations present significant negatives for the custody or community, auditing is required.

Restitution is a required payment that, like sentence calculations, may change the way it is to be executed based on other policies of the day. There are limitations for how amounts are to be deducted and what percentage. [redacted]

FINDINGS

PSD's current situation

[redacted]

EXAMPLES

[redacted]

CLARIFYING QUESTIONS

[redacted]

CORE CAPABILITY:

Executing judicial orders

GOAL:

Professional Accountability

STAKEHOLDERS:

- Security — Intake, Transport
- Records
- ISC Intake
- Sheriff Division

CURRENT CAPABILITY LEVEL:

[redacted]

DESCRIPTION

Background information

The courts determine whether someone is to be held in custody, placed on supervised release, sentenced (moved to prison from jail), scheduled to appear, placed on temporary release or released from custody. These decisions are provided to corrections as legal documents. Action is expected to be reasonably immediate and, in the case of intakes and releases, often must be executed by Sheriff deputies as they manage the courthouse cell blocks. [redacted]

Court appearances are often communicated through legal documents but may be rescheduled between the original setting of the date and the event date. These communications are delivered through non-legal documents — court calendars for circuit court. A custody may be transferred from one island to another and will be required to appear at the originating court.

[redacted]

FINDINGS

PSD's current situation

[redacted]

EXAMPLES

[redacted]

CLARIFYING QUESTIONS

[redacted]

CORE CAPABILITY:

Addressing risk/needs (identifying and meeting)

GOAL:

Professional Accountability

STAKEHOLDERS:

- Housing
- Case Managers
- Program Providers
- Health Care

CURRENT CAPABILITY LEVEL:

[redacted]

DESCRIPTION

Background information

After a decision has been made to take action on a risk, the action should be documented. This allows the ability to followup on that action to see that the outcome matches the intended expectation. This requires clear articulation of expected outcome as part of procedures or documented processes. [redacted]

FINDINGS

PSD's current situation

[redacted]

EXAMPLES

[redacted]

CLARIFYING QUESTIONS

[redacted]

CORE CAPABILITY:

Documenting validated data

GOAL:

Professional Accountability

STAKEHOLDERS:

- Case Managers
- Program Providers
- Healthcare
- ISC
- HPA
- Compliance Officers
- Investigations, Grievance

CURRENT CAPABILITY LEVEL:

[redacted]

DESCRIPTION

Background information

Custody information is a collection of data that may come from custody self-disclosures; assessments based on custody information, behavior and history; information from outside agencies and institutions [redacted] and corrections-related investigations. Being able to identify information that has been validated or confirmed is helpful to operations as it enables them to make more concrete determinations and evaluations. Having a system of record is also helpful so even if data is not confirmed as validated, users of the data know that some reconciliation processes have been performed to identify a data set as the most representative.

Validated data is useful to other users of information, particularly those that may want to run a report on aggregate custody data to perform analysis and evaluations on corrections operations, programs, services, and the population.

FINDINGS

PSD's current situation

[redacted]

EXAMPLES

[redacted]

CLARIFYING QUESTIONS

[redacted]

CORE CAPABILITY:

Managing PSD-custody communications

GOAL:

Professional Accountability

STAKEHOLDERS:

- Security
- Case Managers
- Records

CURRENT CAPABILITY LEVEL:

[redacted]

DESCRIPTION

Background information

The custody receives a great deal of information when they enter a facility because the facility is required to communicate a number of rules. Some of these corrections policy processes requires sign-off as confirmation of completion or receipt of notification. [redacted] These are required to ensure that the facility is following procedure and that the custody is aware of the rules, findings, assessments and calculations.

FINDINGS

PSD's current situation

[redacted]

EXAMPLES

[redacted]

CLARIFYING QUESTIONS

[redacted]

"By bringing this development in-house and within our own information technology division, our agency is able to account for more precise timetables on deliverables, have increased accountability on the accurate functionality of the new tool in a way that demonstrates our commitment to being good stewards of taxpayer dollars."

— *Department of Corrections, Washington State, commenting on the amicable termination of one of their vendor contracts*

5

—

Considering Software Replacement

Findings, insights, recommendations and requirements that pertain to **IT software replacement** action.

—

+ Best Practices May Not Be Obvious
+ How It Rolls Up
+ Be Specific About Your Constraints
+ Understand Your Investment
+ Advisories
+ Recommendations
+ Modular Contracting
+ Paper Is an Option
+ Progress Is Not All-or-Nothing

The previous sections discuss the required department capabilities enabling the development of a well-managed data infrastructure and reduced risk. Here, we discuss how to think about software projects and the options for consideration.

Best Practices May Not Be Obvious

First, some key myth-busting facts that we want to share:

FACT 1:
IT DECISIONS SHOULD BE MADE BY BOTH OPERATIONS AND IT EXPERTS

IT decisions will very rarely be an IT-only decision. Expect to have numerous discussions between executives, IT personnel and process owners throughout any software project, starting with the decision to do a software project. IT projects are change management projects and will frequently involve policy, standards and other changes, that fall outside the purview of IT responsibility. Process owners are important subject matter experts that should take ownership for changes as well. However, they will be unable to make executive-level decisions. In the table below, notice that "lack of executive support and commitment" are critical in the first stage, just as is "insufficient user commitment and involvement." Everyone plays a significant role in these projects. Don't forget that people processes come first, technology second.

FACT 2:
TECHNICAL SKILLS ARE REQUIRED EVEN IF PRIMARY SERVICES ARE CONTRACTED OUT

In-house technical skills are required to help you understand what services to contract and to help you evaluate and monitor services. So where is the difference? They are required in fewer number. Similarly, project management skills within the in-house IT capabilities will help in the evaluation and monitoring of services but, unlike technical capabilities, you shouldn't expect to contract it out. Knowledge of internal processes and culture are highly valuable for effective project management. Look back at the previous table and see where "inadequate technical know-how", "problematic technology base/infrastructure," and "project management and control problems" play critical roles. There's time to get these things in shape as you're defining your next project but you'll need to have the skills in place when the project is ready to go.

fig. 11 **Impact of abandonment factors on software development stages**

ABANDONMENT FACTORS	Software Development Stages		
	REQUIREMENTS STAGE	DESIGN STAGE	IMPLEMENTATION STAGE
Unrealistic project goals and objectives	Critical	Critical	Critical
Inappropriate project-team composition	Less Critical	Critical	Mildly Critical
Project management and control problems	Less Critical	Critical	Critical
Inadequate technical know-how	Less Critical	Critical	Critical
Problematic technology base/infrastructure	Less Critical	Critical	Critical
Changing requirements	Critical	Critical	Critical
Lack of executive support and commitment	Critical	Mildly Critical	Mildly Critical
Insufficient user commitment and involvement	Critical	Mildly Critical	Less Critical
Cost overruns and schedule delays	Less Critical	Mildly Critical	Critical

Ewusi-Mensah, Kweku. Software Development Failures: Anatomy of Abandoned Projects. The MIT Press, 2003.

FACT 3:
A CRITICAL PROJECT SHOULD BE SCOPED DOWN AS MUCH AS POSSIBLE

Critical projects equate to high risk. To contain the risks, it is best to keep the scope small. A common mistake is to put as much as possible into the scope of a critical project under the assumption that everything will be fixed together. However, as the scale of a project increases, the level of complexity for communication and management rise exponentially and the risk level rises with it. Consider that even a small project if not well-managed can be exhausting. Software projects are change projects first and require a lot of engagement with people and processes. The technology is secondary. Don't overestimate the department's capacity for handling this strain and inadvertently cause burnout on your first project. It will demoralize engaged staff and undermine future change efforts for the department as a whole. Stay focused and deliver incremental changes. Build a pipeline of these small projects. Find a pace that is sustainable. Provide an opportunity to rest and reflect on the hard work, evaluate your process and celebrate wins. Iterate. Make completion of these small projects a habit and you'll find yourself making substantial gains.

A TIP TO SCOPING PROJECTS:

Understand root cause of your issues and find something to target that will chip away at the problem. That's right, don't expect to solve it in one project. And then, for that "chip" that you've selected, scope it further. Think about designing an MVP — minimum viable product.

A **minimum viable product (MVP)** is a commitment is a product with just enough features to satisfy early customers, and to provide feedback for future product development.[1][2]

Gathering insights from an MVP is often less expensive than developing a product with more features, which increases costs and risk if the product fails, for example, due to incorrect assumptions.

...

A minimum viable product has just enough core features to effectively deploy the product, and no more. Developers typically deploy the product to a subset of possible customers—such as early adopters thought to be more forgiving, more likely to give feedback, and able to grasp a product vision from an early prototype or marketing information. This strategy targets avoiding building products that customers do not want and seeks to maximize information about the customer per amount of money spent.

Wikipedia: "Minimum viable product," retrieved Jan 24, 2019.

How It Rolls Up

The previous sections cover what you need in order to determine what you want from a software solution.

The other large piece to consider is knowing what you want from the implementation activities, whether it be a vendor or in-house development task. Some of this work is part of defining capabilities and risks. Another component is understanding constraints. *See figure 12 on next page.*

Be Specific About Your Constraints

What are some of the administrative, operational, regulatory, high risk needs that might shape your decision-making? Gather the list of unmovable pieces that may constrain your available options. Evaluate your constraints to determine whether the considerations are truly unmovable or if they are attempts to avoid uncomfortable hurdles or very difficult negotiations. Acknowledging the difference is helpful for providing flexibility in thinking and will not lessen the importance of these challenges further on in the process.

Typical considerations may revolve around timing, budget, personnel, facilities, equipment, external factors such as public climate, regulations, legislation, etc. Depending on the kind of project, it may also involve considerations of client/custodies, information availability, partner availability and partner constraints. Evaluate these considerations and determine how they impact timing, budget or personnel capabilities.

As an example, developing additional functionality for the Transportation Dashboard that requires fixes to judiciary data may require judiciary buy-in and support from judiciary IT services. The desired project may be constrained by existing project timelines and therefore a PSD project may need to be timed to coordinate with judiciary's project schedule. If the vendor is expected to interface with the judiciary system and work with their IT team, details specifying these needs should be mentioned as part of the project requirements.

For a start of these considerations for Corrections, see the Appendix: *Custody Information Management Assumptions and Constraints* (page 196).

Evaluate what you want versus what you need and identify your priorities. This will be important when stepping into vendor evaluations, and future vendor negotiations regarding requirements and design.

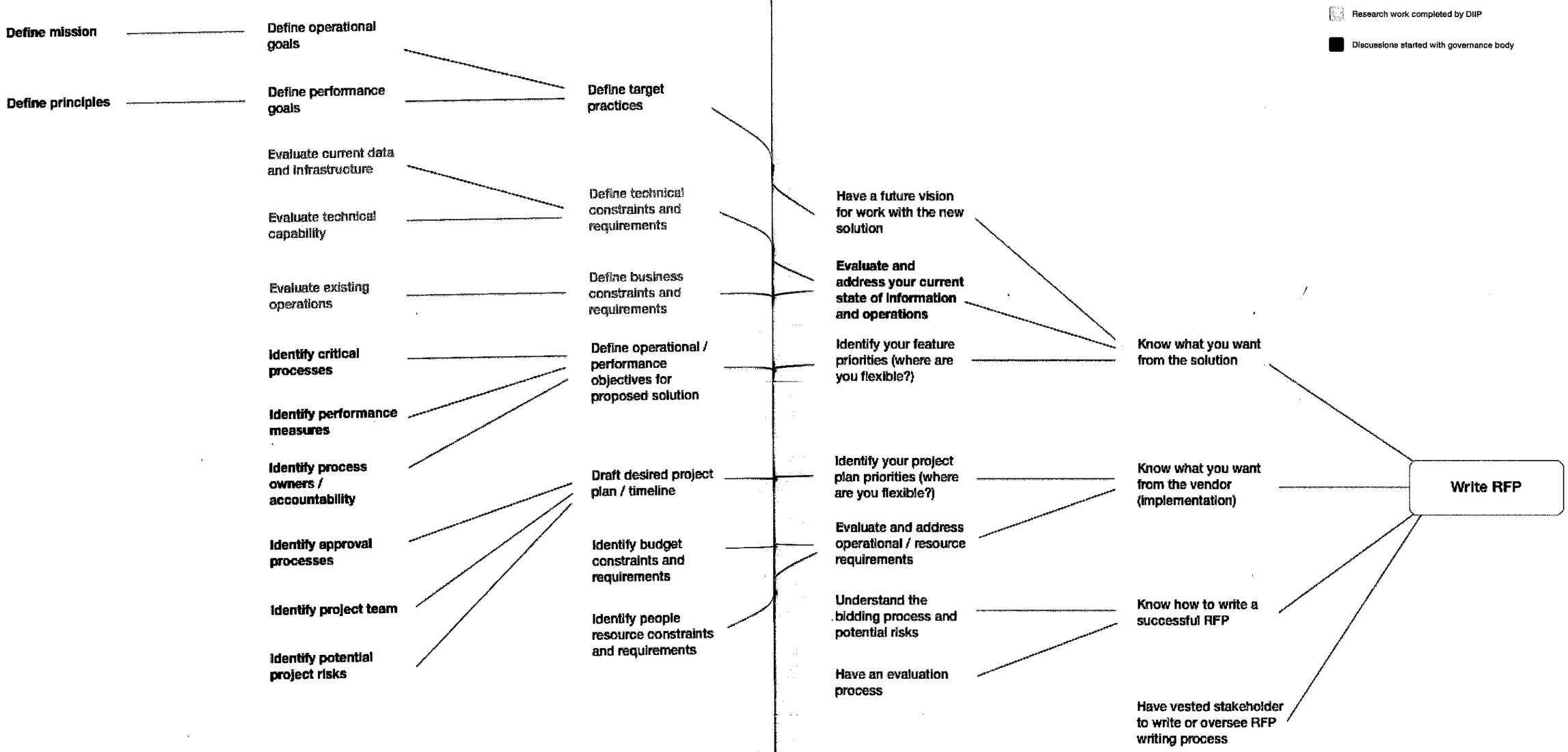


fig. 12 **Required activities to develop an RFP or requirements document**

The following is a backwards plan of how different activities are required to develop an RFP or finalized project requirements document for in-house development work. The four key elements are knowing what you want from the proposed solution, knowing what you want from the implementation (vendor or in-house development support), knowing how to articulate these needs in writing for the desired implementation approach, and having a vested stakeholder ready to manage the writing. This stakeholder should be the same person who takes this document into the evaluation and project implementation stage. They should continue to play a key project management role for the project.

Understand Your Investment

Software projects can vary considerably in time and cost. The biggest determinants are scope and scale because they affect the complexity of the project. A greater number of features and requirements increases the technical complexity and a large rollout increases the management complexity. Typically large scale projects are a combination of both complexity and size, as small-scope projects are rarely rolled out to a large user group as a single project implementation.

Use of vendor or contract services is a secondary contributor towards time and cost evaluations. Vendor or contract services as compared with in-house services is often more expensive but make a project faster as it addresses skills or bandwidth limitations.

The return on investment can be looked at from two perspectives — the satisfaction with the product outcome (how well it meets expectations) and the skill development that comes as a byproduct of the software project.

Satisfaction with product outcome is highly dependent upon a variety of factors that lead into project planning, in addition to the implementation itself. The smaller the scope, the better the chance that the solution will meet expectations as the expectations have less opportunity to be out-sized or poorly defined.

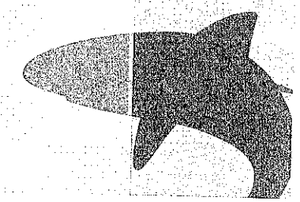
Skill development is the level of experience gained from participation in a project. In-house projects necessarily develop more skills but all projects provide exposure to a project cycle. Smaller projects provide insight into more parts of a project than large projects where responsibilities are more siloed.

Most importantly, there are personnel resource investment differences for different types of projects. All projects will require project management skills but large projects, due to the complexity and size will be much more involved and may require many more layers of management and communication tasks, than would be necessary on smaller projects. The clarity of the process and desired solution impacts the breadth of skills necessary. The less well-defined the problem or solution space, the more business analysts, designers, and line persons will be required in the project definition. This is true for large scale vendor projects to small in-house projects with the difference between them being the number of stakeholders involved. This can be a time-consuming and crucial part of the project that should not be overlooked. If the scope of a project is smaller or developed off of an existing product solution, the process-owners rather than the line persons will be required for more decision-making regarding feature requirements and customizations. In-house projects obviously require technical development capabilities but vendor-managed projects will also require IT involvement to provide input, guidance and general assistance to coordinate the necessary department actions to facilitate the project. The scale of the project determines how much of their time is required.

The diagram to the right attempts to show how these factors compare when considering project options. We have not listed large in-house development projects as options as there is a considerable skills gap that make them an unfeasible option for present capabilities.

fig. 13 **Software projects vary considerably in time and cost**
(specifically pertaining to PSD's perceptions and capabilities)

	$	$$	$$$	$$$$...
	Small in-house project with some development portions contracted out. May bring in specific skills such as design, development, security and content management for the duration of a project. Will develop project management capabilities and exposure to broad range of project skills.	**Vendor-managed small project with department champion for accountability and project management liaison to coordinate activities.** Builds awareness of project needs but may not develop skills other than project management capabilities.		*Larger projects*
	Small in-house development project. May take longer due to bandwidth constraints. Will develop a broad range of project skills.	**Medium in-house project with some development or other skills contracted out.** Will develop some range of project skills with significant project management capabilities.	**Vendor-managed medium-scale product implementation with customization.** Rely on engagement from process owners and project management personnel. Will require input and assistance from IT staff. Exposure to typical project lifecycle and range of project skills.	*Larger projects*
		Medium in-house development project. Would develop a broad range of skills and greater depth of experience. Return on investment over the long term. (Requires significant hiring to fill necessary skills gaps.)	**Vendor-managed custom enterprise project.** Rely on broad range of skills and strong engagement from subject matter experts, process owners, and very dedicated business analysts and project managers to ensure department involvement. (Requires hiring to fill necessary skills gaps.)	*Larger projects*
...	*Larger projects*	*Larger projects*	*Larger projects*	*Larger projects*



Advisories

There are two specific options that we want to specifically advise against:

LAYERED OUTSOURCING

If a large-scale enterprise software project is undertaken, there may be offers to have project management outsourced to a vendor separate from your primary development and implementation vendor. We advise against this options as based on outcomes from other large scale projects, the risks are too high. Communication is essential on software projects and increasing the lines of communication exponentially increases challenges.

[redacted]

Recommendations

[redacted]

Modular Contracting

Modular contracting is a means of scoping projects and procuring technology services in smaller, low-risk pieces. The following is a direct excerpt from 18F's Digital Playbook regarding modular contracting. 18F is the consulting agency within the Government Digital Services and a resource for best practices.

> As described in the Federal Acquisition Regulation (FAR) (http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/far/39.htm), modular contracting is:
>
> "intended to reduce program risk and to incentivize contractor performance while meeting the Government's need for timely access to rapidly changing technology.
>
> When using modular contracting, an acquisition of a system of information technology may be divided into several smaller acquisition increments that:
>
> - Are easier to manage individually than would be possible in one comprehensive acquisition;
> - Address complex information technology objectives incrementally in order to enhance the likelihood of achieving workable systems or solutions for attainment of those objectives;
> - Provide for delivery, implementation, and testing of workable systems or solutions in discrete increments, each of which comprises a system or solution that is not dependent on any subsequent increment in order to perform its principal functions;
> - Provide an opportunity for subsequent increments to take advantage of any evolution in technology or needs that occur during implementation and use of the earlier increments; and
> - Reduce risk of potential adverse consequences on the overall project by isolating and avoiding custom-designed components of the system."
>
> As defined in Clinger-Cohen legislation and Executive Order, modular contracting is an acquisition strategy that breaks a large "grand design" program into discrete components that are easier to manage. It provides for the delivery, implementation, and testing of a workable system or solution in discrete increments or modules. Per FAR 39.002, modular contracting "means use of one or more contracts to acquire information technology systems in successive, interoperable increments."

An example of a project that has already been undertaken using this model is the Transportation Dashboard project. It carved out a narrow scope in addressing a more complex and bigger picture issue of communications between judiciary and PSD

[redacted]

The smaller project scope also allowed for direct management engagement and improved communication lines between all stakeholders, and the vendor at all times for better accountability.

A TIP TO REDESIGNING PROCESSES:

It is helpful to plan a new system process such that the backup or fall back plan is to continue doing what is done presently. Revising the system to make existing processes completely irrelevant is much more disruptive and challenging due to the added level of complexity for both users and the implementation team, particularly in testing, training and rollout phases of the project.

The determination of the project scope for any technology project requires alignment between executive vision, process owner operational goals and needs, as well as knowledge of line workers — your subject matter experts. It is a project in itself. If developing a project feels like unfamiliar territory, we have provided some exercises in the Appendix *(Handy Data Related Thought Exercises, page 186)* to help you think through and evaluate your needs.

Once you have understood the needs of your technology solution, 18F has provided a great resource for how to develop these needs towards implementing a solution. Even if you will not be building your solution in house, these are critical decisions that need to be made so you know what to ask of your vendor. And if you can't make a decision, knowing what your priorities are will help you with developing questions for your vendors when the time comes to start evaluating your options. Included in the Appendix is 18F's Digital Services Playbook *(page 173)* that was created specifically for the purpose of helping government agencies through the process of developing a appropriately-sized project. It may be more clearly applicable to a software application but can be applied conceptually to all technology projects.

Another option is to ask 18F or the General Services Administration (GSA) Assisted Acquisition Services (AAS) for help! 18F is part of the General Services Administration and provides acquisition assistance to federal and state agencies provided that they are receiving federal funds. To learn more about what they can do:

https://aas.gsa.gov/services.html
https://18f.gsa.gov/what-we-deliver/

Paper Is an Option

If the prospect of a technology project feels too daunting, moving to digital isn't a necessity just yet. It is required if the vision is to have the kind of streamlined data flow and data-driven decisions that we often hear discussed. Improvements can be made, and should be made, to standardize processes as they exist outside of databases.

Improving existing paper processes may not seem revolutionary at the outset but it has the potential to be transformative. It is a gentler introduction to change management projects since the changes are more tangible and likely easier to communicate. It can provide experiences in project management, requirements gathering, process redesign, decision-making, training and rollout that is needed in software projects. It also requires little technical capability or support that makes it a great way to start if additional technology capabilities or funding are not on the horizon.

Progress Is Not All-or-Nothing

Technology is change that requires you to steer it in the direction of improvement and progress, rather than restriction, rigidity, or risk. You need a vision, a plan, and a team but expect these to change over time. Learn to be comfortable with the ambiguity of not always knowing exactly where you're headed or how you're going to get there. Be firm with your vision, flexible with your plan, and supportive of your team. Reassess regularly. It's okay to not know how to do things or make low-risk mistakes. Consider each action as a learning opportunity. The development of your digital maturity will be unique to your organization. The goal is to develop a positive trajectory, there's no fixed destination of "success" just as there is no "done" to improvement.

Appendix

+ IT Strategy Appendix:
  - IT Governance Framework — Strategy
  - IT Governance Framework — Goals
  - IT Governance Framework — Decisions
  - Enterprise Architecture for the Department
  - Enterprise Architecture for Corrections Operations
  - IT Governance Risk Discussion List
  - 4A Framework — Useful Questions for Discussing IT Risk
  - 5 Whys
  - Ishikawa Fishbone Diagramming
  - Eisenhower Matrix
  - Six IT Decisions That Your IT People Shouldn't Make

+ IT Operations and Management Appendix:
  - UK.gov Position Descriptions

+ Corrections Processes Appendix:
  - Data Models
  - Data Dictionaries
  - EPIC Summary

+ Software Replacement:
  - Digital Services 18F Playbook
  - Handy Data-Related Though Exercises
  - Custody Information Management Recommendations & Requirements
  - Transportation Dashboard
  - Case Notes Mockups

+ References

Appendix: IT Strategy

IT Governance Framework Strategy

The mission of the Department of Public Safety (PSD) is to uphold justice and public safety by providing correctional and law enforcement services to Hawaii's communities with professionalism, integrity and fairness.

	Operational Strategy	Operating Models (Recommended)
Corrections	• Manage over-population by running safe, secure and humane operations.	[redacted]
Law Enforcement	• Protect life and property on state lands and facilities by enforcing statutes, laws and rules. • Promote health and safety by 1) conducting controlled substance and regulated chemical investigations and 2) providing education and training.	
Administration	• Provide effective and efficient support services. • Public safety as a career • Info is readily available (one-stop-shop) Partner relationships: • Maintain efficiency collecting money from inmates for restitution. • Educate legislature of PSD needs and get buy-in • Gather external perspectives from the commission (CPMC) • Build a positive relationship with HPA and other LE. • Develop positive relationships with judicial partners through programs. • Educate non-profits and businesses on the benefits that PSD provides.	

IT Governance Framework Goals

On journey to uphold justice and public safety, we integrate best practices as we strive to develop an engaged and well-trained workforce by reducing disciplinary actions (by ___%) by 20__.

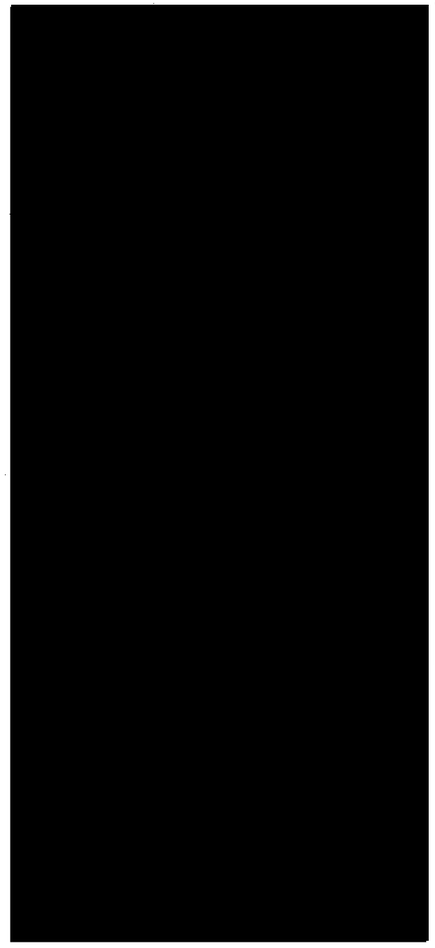
Operational performance goals

- Integrate and enforce best practices for operations
- Reduce the number of workplace issues requiring investigation or disciplinary actions (all divisions)
- Develop an engaged and well-trained workforce

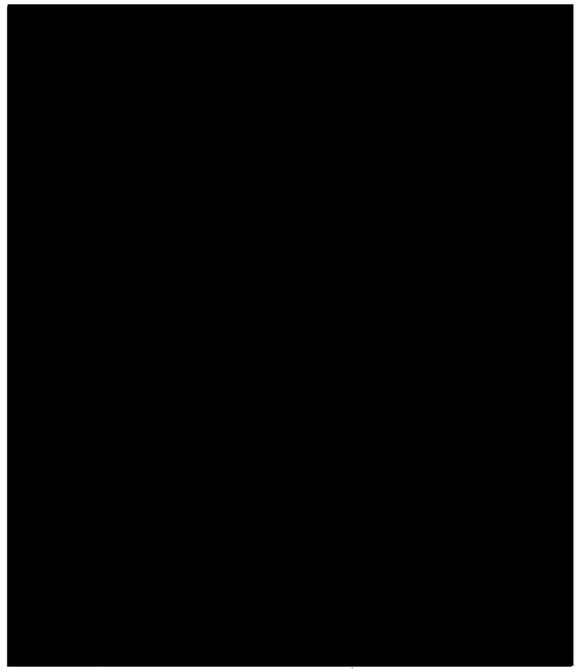
IT performance goals (possibilities)

IT Governance Framework Decisions

IT governance decision-makers



IT governance mechanisms (possibilities)



Enterprise Architecture for the Department

[redacted]

Enterprise Architecture for Corrections Operations

[redacted]

IT Governance Body: Risk Discussion List

4A Framework —Useful Questions for Discussing IT Risk

5 Whys

5 Whys is an iterative interrogative technique used to explore the cause-and-effect relationships underlying a particular problem. The primary goal of the technique is to determine the root cause of a defect or problem by repeating the question "Why?". Each answer forms the basis of the next question. The "5" in the name derives from an anecdotal observation on the number of iterations needed to resolve the problem.

Not all problems have a single root cause. If one wishes to uncover multiple root causes, the method must be repeated asking a different sequence of questions each time.

The method provides no hard and fast rules about what lines of questions to explore, or how long to continue the search for additional root causes. Thus, even when the method is closely followed, the outcome still depends upon the knowledge and persistence of the people involved.

From Wikipedia: "5 Whys", Retrieved Jan 21, 2019.
https://en.wikipedia.org/wiki/5_Whys

Sometimes the issues raised to the IT Governance Body may be representative of a symptom rather than a root cause. When this is the case, it would be worthwhile to try to identify the root cause before assigning a solution to ensure that you are optimizing your efforts and distinguishing between low-hanging fruit and short-term fixes. Five Why's is an exercise in root cause investigation and try to identify items that are directly actionable by the department while recognizing where relationships with other agencies may play a significant role

Ishikawa Fishbone Diagramming

Ishikawa/Fishbone Diagram (Six Sigma Methodology)

- Using "key assets" as categories for this diagram but can use different categorizations as you see most appropriate

Ishikawa diagrams (also called fishbone diagrams, herringbone diagrams, cause-and-effect diagrams, or Fishikawa) are causal diagrams created by Kaoru Ishikawa that show the causes of a specific event.[1]

Common uses of the Ishikawa diagram are product design and quality defect prevention to identify potential factors causing an overall effect. Each cause or reason for imperfection is a source of variation. Causes are usually grouped into major categories to identify and classify these sources of variation.

(From: Wikipedia: "Ishikawa Diagram", Retrieved Jan 21, 2019. https://en.wikipedia.org/wiki/Ishikawa_diagram)

The Ishikawa diagram can also be useful for breaking down a problem into a variety of root causes similar to the 5 Whys.

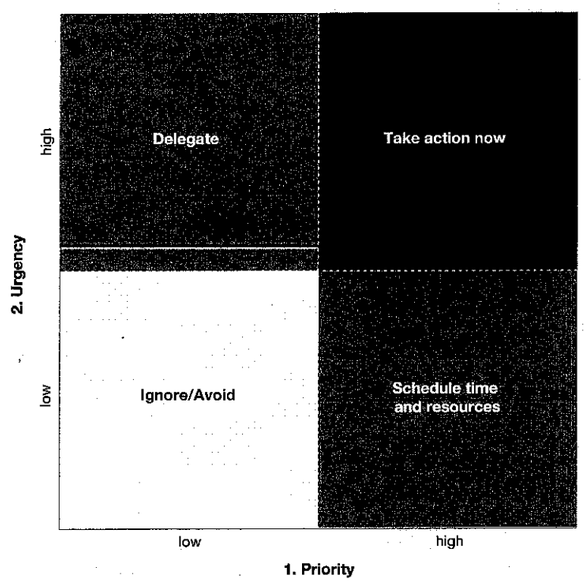
This method may also be a quicker means of identifying opportunities for how to solve an issue. The primary bone structure in the example uses "key assets" as categories but they can be redefined for the best opportunity areas. This may be particularly helpful when trying to understand the role that IT can play and where the policies or processes might be a central consideration.

Westerman, George and Richard Hunter. "Developing a Common Language About IT Risk Management." CISR WP No. 377 and MIT Sloan WP No. 4933-11. Massachusetts Institute of Technology, Center for Information Systems Research, Sloan School of Management, June 2009.

Eisenhower Matrix (Prioritizing for Action)

Develops an engaged and well-trained workforce and reduces disciplinary actions

The Eisenhower Matrix is a quick means for triaging risks in order to prioritize for action. The primary consideration is priority, or importance, of the issue. The secondary consideration is urgency. The framework is useful for the IT Governance Body in evaluating issues that arise for evaluation. To ensure alignment with goals, consider the performance goals and general operating strategies when determining the appropriate priority.



- Items that are important and urgent belong in the "Take action now" category and are for immediate decision and action by the executive level.
- Important items that are not urgent fall under "Schedule time & resources."
- Items in that category should be considered and assigned a specific time and accountability for unambiguity regarding when and how to return to and address the issue.
- Low importance items that are urgent will still need to be handled but they are best left to someone other than executive leadership to manage. "Delegate" means to hand the evaluation, decision-making, and response to someone else. Identify that person.
- Low priority and low urgency items should be ignored or avoided for the time being. Focus efforts and available resources on what matters most.

Six IT Decisions That Your IT People Shouldn't Make

Appendix: IT Operations

UK.gov Position Descriptions

The following position descriptions are from gov.uk's Digital, Data and Technology capability Framework. These represent the capabilities that are needed to support PSD's operations.

Business relationship manager

A business relationship manager is responsible for acting as the liaison between the business and a selected customer group within a department to understand the operational and developmental needs of the business.

Business relationship managers:

- assist with the oversight and prioritisation of IT and digital projects
- act as the first point of contact for the customer directorate
- are considered as a trusted partner in representing the internal customer's digital and technology needs within the department
- are actively involved in agile delivery

Change and release manager

Change and release managers lead the change advisory board, ensuring adequate risk assessment and scheduling of technical changes and releases.

They also own the configuration management database, access, security, configuration of change activities and release procedures.

Command and control centre manager

Command and control centre managers proactively monitor live services and performance trends to identify potential problems or areas for improvement that can then be investigated.

DDat Capability Framework Position Descriptions *continued*

Engineer — application operations

An engineer — application operations supports, manages and maintains a single application or a suite of applications.

Engineers — application operations:

- make sure applications are available within service level agreements and are working to design
- maintain software levels and the security of the applications
- carry out activities in incident, problem, change and configuration management and continual service improvement processes

Engineer — end user computing

An engineer — end user computing is responsible for managing the lifecycle of all service raised incidents (incident control) and all service requests (request control), requiring the use of knowledge management.

They are also responsible for informing customers on progress and advising on workarounds where necessary, as well as the support and maintenance of end user services.

Engineer — infrastructure operations

An engineer — infrastructure operations supports, manages and maintains the core infrastructure that underpins production services.

Engineers — infrastructure operations:

- make sure that the infrastructure is available within service level agreements (SLAs) and operational level agreements (OLAs) and is functioning as designed
- maintain patching levels and the security of the information
- carry out activities in incident, problem, change and configuration management and continual service improvement (CSI) processes

Incident manager

Incident managers aim to restore normal service operation as quickly as possible and minimise any adverse effect on business operations. This makes sure that the best possible levels of service quality and availability are returned and maintained.

IT service manager

IT service managers are responsible for managing the service delivery of information and communications technology (ICT) services and working with teams from IT service operations.

IT service managers:

- are responsible for making sure that business relations within the organisation are managed to enable delivery of ICT services
- lead and direct teams to make sure that service level agreements (SLAs) and operational level agreements (OLAs) are in place with both external and internal teams
- make sure all contractors carry out processes to ITIL standards
- liaise with all other IT service functions to make sure that services are maintained
- manage the day to day delivery of the product
- plan and may schedule the testing and deployment of releases
- deliver new functionality required by the business while protecting the integrity of existing services
- make sure that service asset and configuration items are properly controlled, and that accurate and reliable information about these assets is available when needed

Problem manager

Problem managers aim to resolve and control the root causes of incidents caused by errors within the IT infrastructure. They also work to prevent the recurrence of these incidents.

Service desk manager

A service desk manager is responsible for managing the first and second line technical support for all departmental IT applications and services across sites, including end-user computing. This includes multi-function devices and specialised IT equipment.

They are responsible for ensuring support for existing and emerging information and communications technology (ICT) services, including providing technical advice to project teams

Service transition manager

IT service transition managers provide overall planning for service transitions and coordinate the resources that they require.

They control the lifecycle of all changes, enabling beneficial changes to be made with minimum disruption to IT services.

DDat Capability Framework Position Descriptions *continued*

Business analyst

Business analysts understand and analyse user and business needs.

Business analysts:

- make sure outcomes are aligned with service vision and business strategy by contributing to the link between current and future business models and delivering to the business architecture
- challenge constructively and act as a critical friend to achieve solutions that are fit for purpose
- facilitate collaboration and lead effective communication with all stakeholders to support design, build and delivery to meet the user needs

Programme delivery manager

A programme delivery manager is accountable for the delivery of complex products and services that are being delivered by multiple teams or have high technical or political risk.

Programme delivery managers:

- manage dependencies of varying complexity, potentially planning and feeding into larger programmes and portfolios
- remove blockers and manage risks, commercials, budgets and people
- balance objectives and can redeploy people and resources as priorities change
- have an in-depth knowledge of agile and other methodologies
- are responsible for understanding, managing and communicating between complex stakeholder groups, balancing priorities
- are the initial escalation point for the programme and must have an awareness of the bigger picture
- support the programme director by overseeing the delivery of their vision for the programme
- support and coach delivery managers

Data architect

A data architect sets the vision for the organisation's use of data, through data design, to meet business needs.

Data architects:

- take part in technical and business design authorities in order to approve their vision for data
- work with senior accountable officers and boards to define data strategies and principles
- make sure that systems are designed, upgraded, managed, de-commissioned and archived in compliance with data policy across the full data life cycle

Development operations

Development operations support the development and operation of software through tools, environments and practices.

They are responsible for underpinning good development processes including managing tools and testing environments, central code control, maintaining development standards and writing software that automates systems. This role is commonly referred to as 'DevOp'.

Infrastructure engineer

An infrastructure engineer designs, builds, manages and supports the infrastructure services that underpin all internal user services and services to the public.

Network architect

A network architect is responsible for network designs and specifications, including cloud networks.

Network architects:

- provide advice and guidance to their teams to ensure effective use of standards, principles, tools and patterns
- work to maximise the value that can be delivered from government networks
- are aware of and incorporate security into network designs
- have an understanding of network technology including: LAN, WAN, Wi-Fi, data centre LAN, SD networks, telephony, mobile solutions infrastructure, unified comms, network management solutions, and network specific security and remote access technologies and approaches

Security architect

A security architect designs and builds secure solutions.

Security architects:

- advise and enable technical teams to make security decisions and provide advice and guidance, ensuring the effective use of common tools and patterns
- have a proactive responsibility to deliver secure systems and implement proportionate controls to enable business outcomes

DDat Capability Framework Position Descriptions *continued*

Software developer

A software developer designs, runs and improves software that meets user needs.

They are responsible for writing clean, secure code following a test-driven approach. They create code that is open by default and easy for others to reuse'

Specialist infrastructure engineer

A specialist infrastructure engineer is a focused role which has specific and relevant capabilities to a particular area of infrastructure expertise.

The role fulfils a particular need where there is demand in an organisation. The individual job descriptions may be quite different depending on the demand in the organisation.

Specialist roles include but are not limited to:

- network engineer
- cloud service specialist
- data centre specialist
- security infrastructure

Technical architect

A technical architect provides technical leadership and architectural design.

Technical architects:

- have a good understanding of a broad range of technologies
- are able to converse easily with and translate between non-technical stakeholders and technical practitioners
- are able to switch between different problems and responsibilities and directly involved in service delivery

Technical specialist architect

A technical specialist architect is a focused role which has specific and relevant capabilities to a particular area of architectural expertise.

It fulfils a particular need where there is demand in an organisation. The individual job descriptions may be quite different depending on the demand in the organisation

Appendix: Corrections Processes

Data Models

Data and Database Analysis

We reviewed corrections data and databases to evaluate how well the technologies supported operations. We wanted to understand what the impact of database design and management had on the capabilities of corrections operations.

We referenced our process observations regarding system utilization against what we observed in the data. We looked at the data models and considered the process workflows.

We were interested in understanding where the value was in these applications and looked for implications of database design in the quality and utility of data.

We broke up the investigation into three parts — modeling the data in the databases, identifying significant sources of custody data and assembling data from different data sources for reports and analysis. Data models reveal insights into database design competency and sophistication of the applications. In many caes, it confirmed what we knew from observation of users interacting with the applications and evaluation of the user interface. Attempting to create data dictionaries forced us to ask questions about what made data significant, valid or usable. It forced us to consider interpretation of data under different contexts and how to communicate these necessary perspectives. Lastly, attempting to join disparate data sets forced questions of data interpretation, hierarchy, reconciliation, normalizing incongruous processes and the challenges of cleaning seemingly "erroneous" data.

From these activities, we made the following key findings:

- A data model is one of many indicators of application quality but not necessarily data quality. It may indicate the level of sophistication of features but will not provide indication of utilization value. The design does severely impact the ability to work with the database from a development perspective. Less sophisticated database design increases database rigidity and will make database management more challenging from a customization and support perspective.

- Data is tightly coupled with context. It is inadvisable to use data without understanding the context in which it was collected and the intent of that data collection process as it may misrepresent "reality." The caution is for the use of aggregate data in research projects or evidence-based reporting purposes as many of the operations database uses have not been standardized, reconciled/audited, or consistently enforced to provide accurate or representative data.

- Assembling data to provide more data to users does not inherently provide more value. Users that are unaccustomed to evaluating processes or asking questions of data will be unable to maximize these efforts to create meaningful reports. This is a low priority for the department's current state.

The following are some of our intermediary work products that were used towards the evaluation. A synthesis and summary of this work is provided at the end of this section.

EPIC (Ethnographic Praxis in Industry) Summary

LESSON:

Data are not pure.
Data do not live in isolation.
People are responsible for data.

Data are influenced by the contexts of collection and use — the people, processes, policies, capabilities and constraints. The impacts of technical design and support of databases, the individuals that are represented in the data, the influences of other agencies and those querying the data should not be overlooked. Data are not static truths. Data are impressionable.

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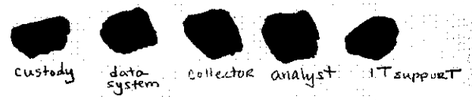

EPIC (Ethnographic Praxis in Industry) Summary *continued*

LESSON:

Strata and Wear Patterns

The usage of a database can change over time.
Operational contexts can shift and may not be documented.

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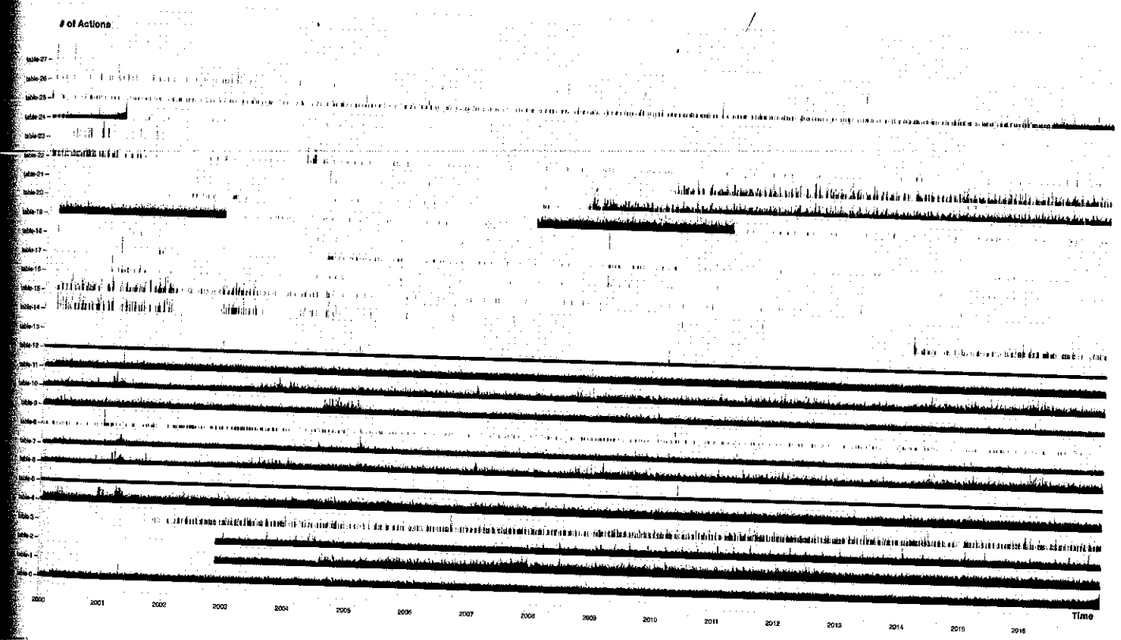

Comparing data tables for the number of database entries made over time allows us to see additions of new tables and other changes of use. Some changes are explained by known policy changes. Other fluctuations or intermittent use are less clear. Knowledge of the operational environment informs us that unforeseen external factors often prompt these changes. Records are coupled to the historical contexts that contributed to their creation. Consideration of these contexts is required for more accurate interpretation of data.

EPIC (Ethnographic Praxis in Industry) Summary *continued*

LESSON:

Constraints of Vocabulary

Questions that we can ask of databases are limited to the kinds of data that were collected in the first place.

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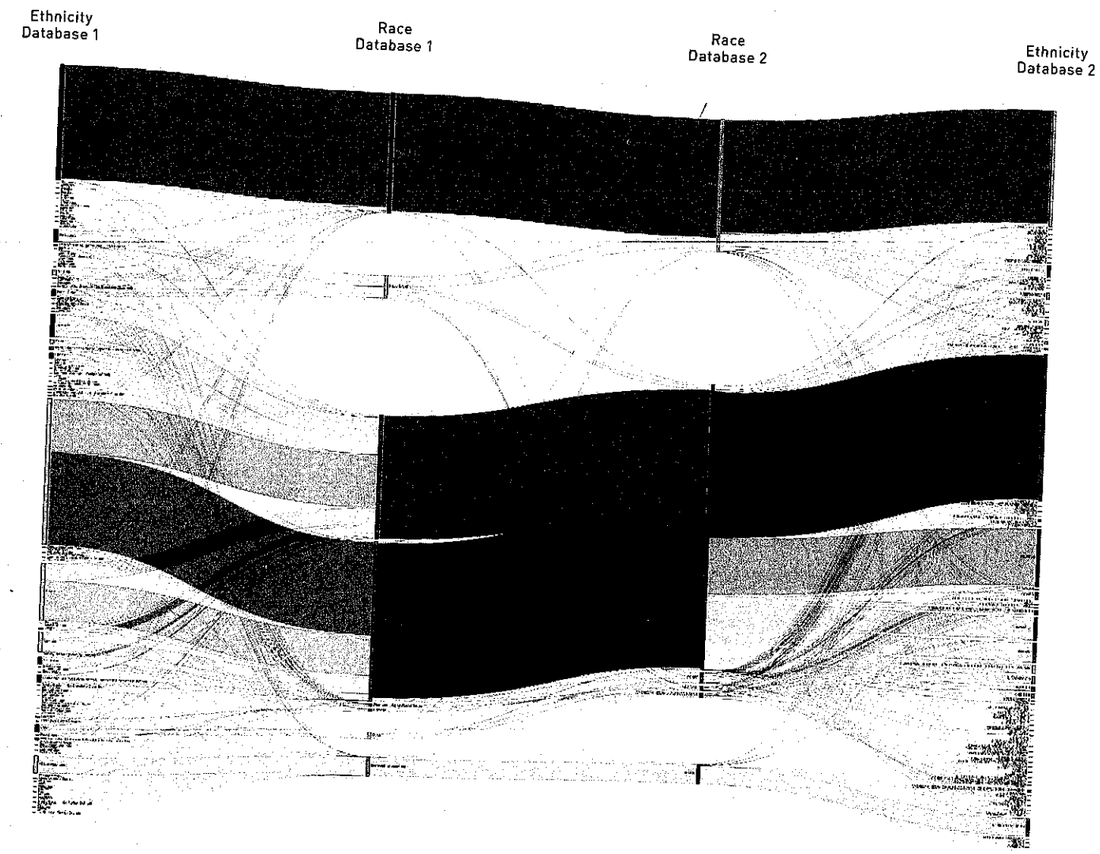

Comparing race and ethnicity data across two different databases revealed different selection options. A single individual may be placed under different categories. Hawai'i is home to a diverse population that includes many mixed race and ethnic identities. How an individual self-identifies may differ from how those entering the data decide to ascribe race. Data may be captured for a specific purpose such as general security classification or program eligibility and funding-related requirements, rather than to represent reality.

EPIC (Ethnographic Praxis in Industry) Summary *continued*

LESSON:

The original intent of data collection can be forgotten over time.

Human memory is an important component in understanding data. Through the interviews, we often found different tellings of the history of the database — the purpose of its use, the ability to utilize features, the reasons for entering specific pieces of data. This historical context was captured and passed on by people as local knowledge, some of which is lost as people move out of positions. Perceptions of information use can influence data entry by changing the timing of data capture, the specificity of the data, and other characteristics regarding the quality of information. Multiple changes to the organizational context can degrade or obscure the purpose of data entry over time.

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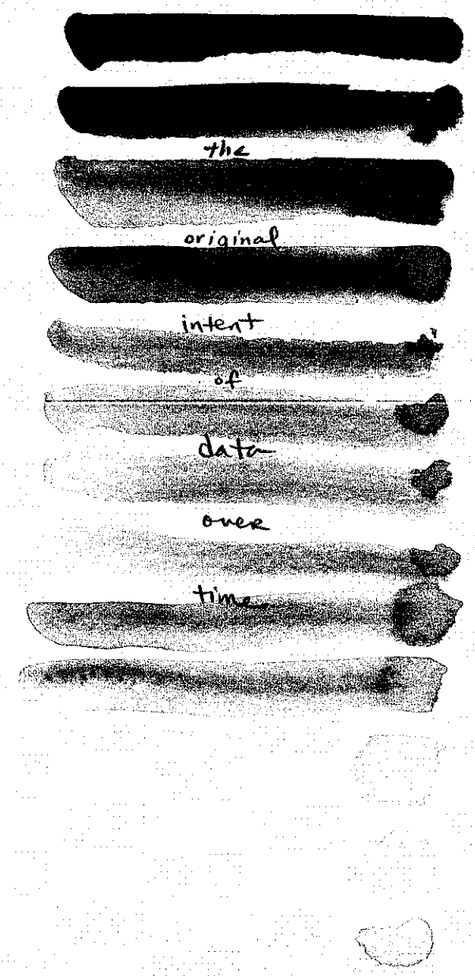

EPIC (Ethnographic Praxis in Industry) Summary *continued*

LESSON:

Data reflect the organizations that built them.

Sometimes data collection can be explained by policy, priorities, or processes. This context may also include the specific interaction variables of the data collection process. As an example, a question of whether a custody has dependents requires an investigation across discrete touch points. The data collected are specific to the context of the interaction such as a social worker intake, a security visitor screening, an education class enrollment or a library reading program. The data collected may vary in granularity because of the purposes they serve but also because of the context of the interaction. What is the state of the custody at the time of the interaction? When is data collected? What value is perceived by the custody or the data collector?

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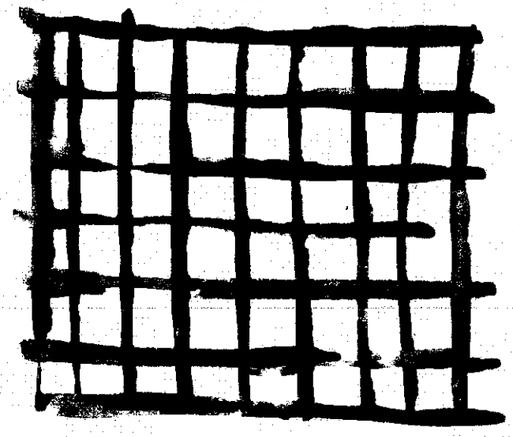
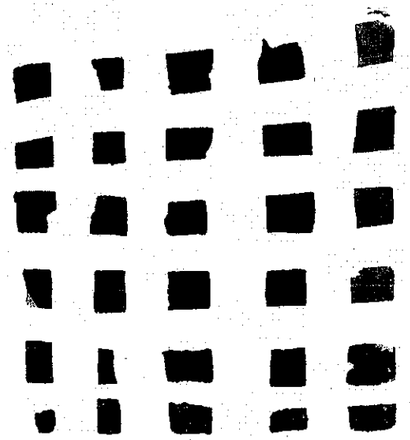
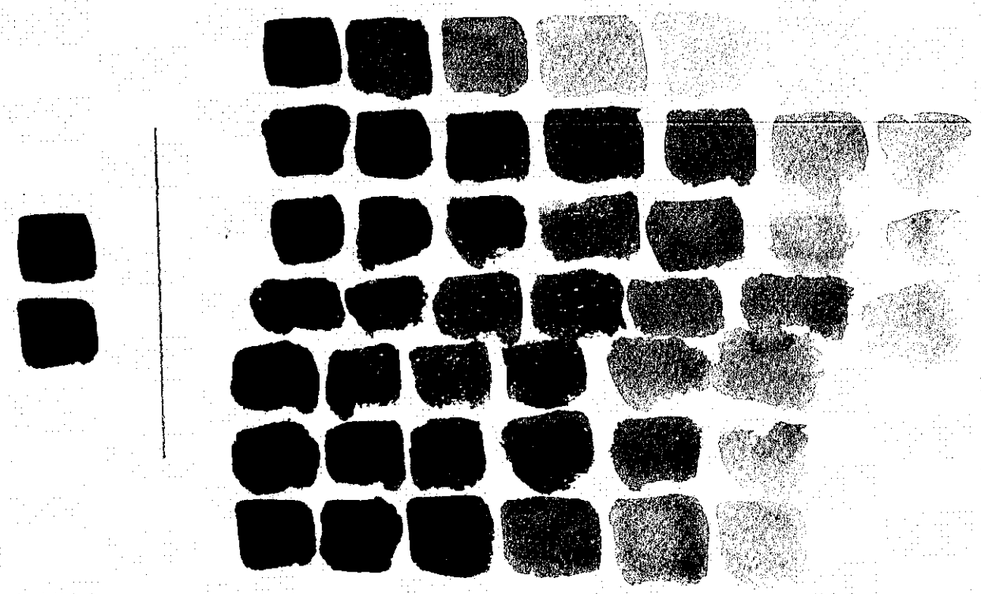




EPIC (Ethnographic Praxis in Industry) Summary *continued*

LESSON:

Data can tell many stories.



Implied relationships might just be coincidence.
We influence the answers we obtain in the framing of our questions.

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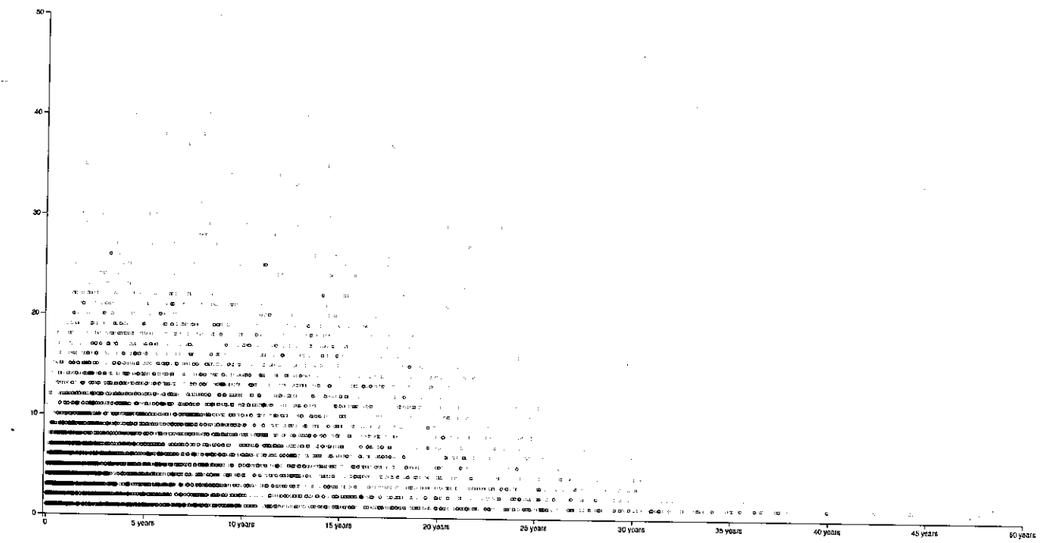
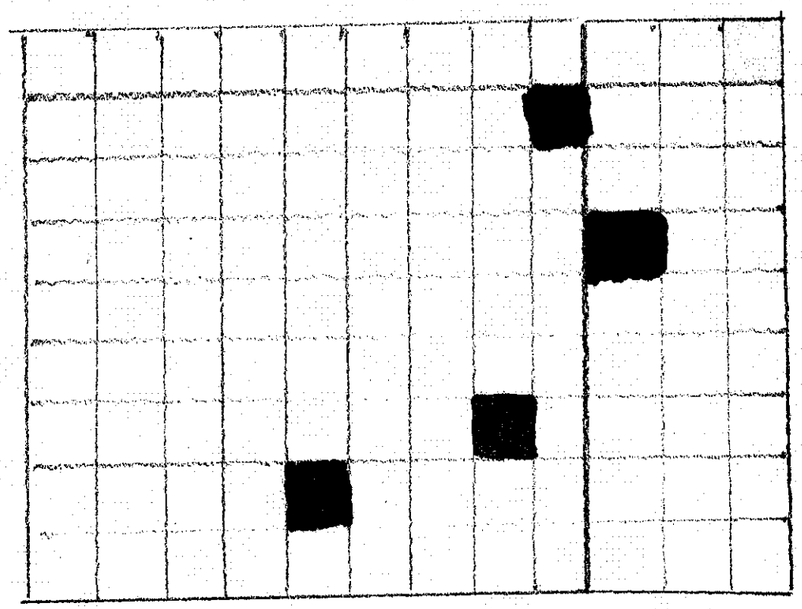


From our interviews, there are salient stories that are told of workplace experiences that have developed into belief systems. Trying to look for evidence of these stories in data is highly subjective. In the dataset above, we have plotted "current" custodies according to how many times they have been incarcerated and their cumulative time served. What patterns do you see? Do you see a story in the data?

EPIC (Ethnographic Praxis in Industry) Summary *continued*

LESSON:

Silences matter.



Absent data carries weight. To only use existing records to tell a story means that the facts that were not documented get left out.

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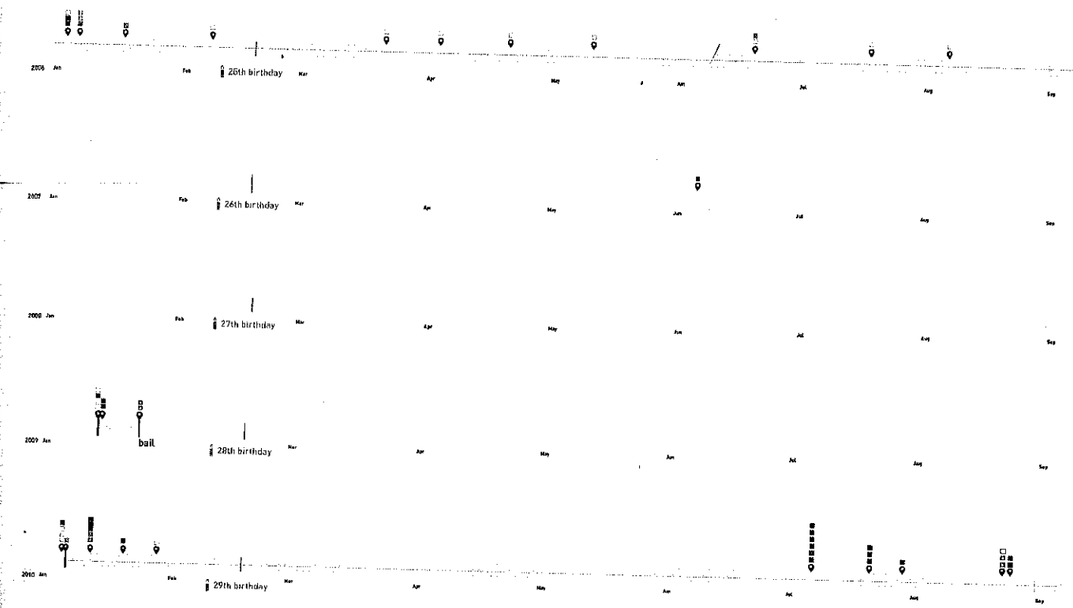


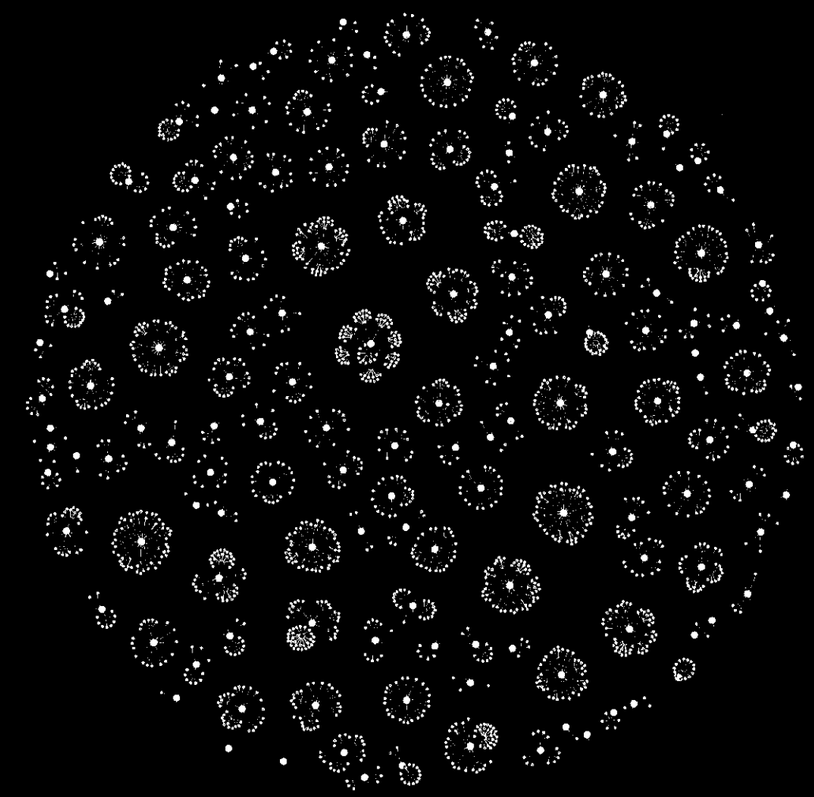
Treating data voids as data provides new perspectives. In the above, a portion of data entries for an individual is plotted on a timeline. The data is humanized with the added marking of their birthday in each passing year. This helps us to comprehend the time scale, consider the context of the actions and better relate to the data as a person's history rather than a listing of events. This mapping allows us to see more concretely where there are limits to our understanding and ask better questions about what the spaces might reveal.

EPIC (Ethnographic Praxis in Industry) Summary *continued*

LESSON:

Database design impacts the shape of data.

Databases are not just collections of data but include embedded relationships between real, abstracted, and interpreted attributes that impact how we can extract meaning. The example visualization shows us a set of individuals and their charges according to the structure of this particular database. Data models, decisions to require data entry, and the interpreted meaning of blank fields are the kinds of technical design considerations that affect the user experience but also affect the implications of the data.



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EPIC (Ethnographic Praxis in Industry) Summary *continued*

LESSON:

Selective collection and validation of clearly intentioned data may be more useful than collecting as much data as possible.

Data collection is not cost-free to organizations. Rebuilding information from decontextualized data is an even larger burden. Consider that in many cases, these data tasks may fall to a variety of personnel that are not researchers and data scientists but security personnel, records clerks and business office administrators. Optimizing data collection for operational support may be a worthy goal. Routine auditing and validation of select data may help to provide stable reference points that can increase the shelf life of the data overall.

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Appendix: Software Replacement

Digital Services 18F Playbook

THE U.S. DIGITAL SERVICE

Digital Services Playbook

The American people expect to interact with government through digital channels such as websites, email, and mobile applications. By building digital services that meet their needs, we can make the delivery of our policy and programs more effective.

Today, too many of our digital services projects do not work well, are delivered late, or are over budget. To increase the success rate of these projects, the U.S. Government needs a new approach. We created a playbook of 13 key "plays" drawn from successful practices from the private sector and government that, if followed together, will help government build effective digital services.

Digital Service Plays

1. Understand what people need
2. Address the whole experience, from start to finish
3. Make it simple and intuitive
4. Build the service using agile and iterative practices
5. Structure budgets and contracts to support delivery
6. Assign one leader and hold that person accountable
7. Bring in experienced teams
8. Choose a modern technology stack
9. Deploy in a flexible hosting environment
10. Automate testing and deployments
11. Manage security and privacy through reusable processes
12. Use data to drive decisions
13. Default to open

PLAY 1

Digital Services 18F Playbook *continued*

Understand what people need

We must begin digital projects by exploring and pinpointing the needs of the people who will use the service, and the ways the service will fit into their lives. Whether the users are members of the public or government employees, policy makers must include real people in their design process from the beginning. The needs of people — not constraints of government structures or silos — should inform technical and design decisions. We need to continually test the products we build with real people to keep us honest about what is important.

Checklist

- Early in the project, spend time with current and prospective users of the service
- Use a range of qualitative and quantitative research methods to determine people's goals, needs, and behaviors; be thoughtful about the time spent
- Test prototypes of solutions with real people, in the field if possible
- Document the findings about user goals, needs, behaviors, and preferences
- Share findings with the team and agency leadership
- Create a prioritized list of tasks the user is trying to accomplish, also known as "user stories"
- As the digital service is being built, regularly test it with potential users to ensure it meets people's needs

Key Questions

- Who are your primary users?
- What user needs will this service address?
- Why does the user want or need this service?
- Which people will have the most difficulty with the service?
- Which research methods were used?
- What were the key findings?
- How were the findings documented? Where can future team members access the documentation?
- How often are you testing with real people?

PLAY 2

Address the whole experience, from start to finish

We need to understand the different ways people will interact with our services, including the actions they take online, through a mobile application, on a phone, or in person. Every encounter — whether it's online or offline — should move the user closer towards their goal.

Checklist

- Understand the different points at which people will interact with the service – both online and in person
- Identify pain points in the current way users interact with the service, and prioritize these according to user needs
- Design the digital parts of the service so that they are integrated with the offline touch points people use to interact with the service
- Develop metrics that will measure how well the service is meeting user needs at each step of the service

Key Questions

- What are the different ways (both online and offline) that people currently accomplish the task the digital service is designed to help with?
- Where are user pain points in the current way people accomplish the task?
- Where does this specific project fit into the larger way people currently obtain the service being offered?
- What metrics will best indicate how well the service is working for its users?

PLAY 3

Make it simple and intuitive

Using a government service shouldn't be stressful, confusing, or daunting. It's our job to build services that are simple and intuitive enough that users succeed the first time, unaided.

Checklist

- Use a simple and flexible design style guide for the service. Use the U.S. Web Design Standards as a default
- Use the design style guide consistently for related digital services
- Give users clear information about where they are in each step of the process
- Follow accessibility best practices to ensure all people can use the service
- Provide users with a way to exit and return later to complete the process
- Use language that is familiar to the user and easy to understand
- Use language and design consistently throughout the service, including online and offline touch points

Key Questions

- What primary tasks are the user trying to accomplish?
- Is the language as plain and universal as possible?

- What languages is your service offered in?
- If a user needs help while using the service, how do they go about getting it?
- How does the service's design visually relate to other government services?

PLAY 4

Build the service using agile and iterative practices

We should use an incremental, fast-paced style of software development to reduce the risk of failure. We want to get working software into users' hands as early as possible to give the design and development team opportunities to adjust based on user feedback about the service. A critical capability is being able to automatically test and deploy the service so that new features can be added often and be put into production easily.

Checklist

- Ship a functioning "minimum viable product" (MVP) that solves a core user need as soon as possible, no longer than three months from the beginning of the project, using a "beta" or "test" period if needed
- Run usability tests frequently to see how well the service works and identify improvements that should be made
- Ensure the individuals building the service communicate closely using techniques such as launch meetings, war rooms, daily standups, and team chat tools
- Keep delivery teams small and focused; limit organizational layers that separate these teams from the business owners
- Release features and improvements multiple times each month
- Create a prioritized list of features and bugs, also known as the "feature backlog" and "bug backlog"
- Use a source code version control system
- Give the entire project team access to the issue tracker and version control system
- Use code reviews to ensure quality

Key Questions

- How long did it take to ship the MVP? If it hasn't shipped yet, when will it?
- How long does it take for a production deployment?
- How many days or weeks are in each iteration/sprint?
- Which version control system is being used?
- How are bugs tracked and tickets issued? What tool is used?

- How is the feature backlog managed? What tool is used?
- How often do you review and reprioritize the feature and bug backlog?
- How do you collect user feedback during development? How is that feedback used to improve the service?
- At each stage of usability testing, which gaps were identified in addressing user needs?

PLAY 5

Structure budgets and contracts to support delivery

To improve our chances of success when contracting out development work, we need to work with experienced budgeting and contracting officers. In cases where we use third parties to help build a service, a well-defined contract can facilitate good development practices like conducting a research and prototyping phase, refining product requirements as the service is built, evaluating open source alternatives, ensuring frequent delivery milestones, and allowing the flexibility to purchase cloud computing resources.

The TechFAR Handbook provides a detailed explanation of the flexibilities in the Federal Acquisition Regulation (FAR) that can help agencies implement this play.

Checklist

- Budget includes research, discovery, and prototyping activities
- Contract is structured to request frequent deliverables, not multi-month milestones
- Contract is structured to hold vendors accountable to deliverables
- Contract gives the government delivery team enough flexibility to adjust feature prioritization and delivery schedule as the project evolves
- Contract ensures open source solutions are evaluated when technology choices are made
- Contract specifies that software and data generated by third parties remains under our control, and can be reused and released to the public as appropriate and in accordance with the law
- Contract allows us to use tools, services, and hosting from vendors with a variety of pricing models, including fixed fees and variable models like "pay-for-what-you-use" services
- Contract specifies a warranty period where defects uncovered by the public are addressed by the vendor at no additional cost to the government
- Contract includes a transition of services period and transition-out plan

Key Questions

- What is the scope of the project? What are the key deliverables?
- What are the milestones? How frequent are they?
- What are the performance metrics defined in the contract (e.g., response time, system uptime, time period to address priority issues)?

PLAY 6

Assign one leader and hold that person accountable

There must be a single product owner who has the authority and responsibility to assign tasks and work elements; make business, product, and technical decisions; and be accountable for the success or failure of the overall service. This product owner is ultimately responsible for how well the service meets needs of its users, which is how a service should be evaluated. The product owner is responsible for ensuring that features are built and managing the feature and bug backlogs.

Checklist

- A product owner has been identified
- All stakeholders agree that the product owner has the authority to assign tasks and make decisions about features and technical implementation details
- The product owner has a product management background with technical experience to assess alternatives and weigh tradeoffs
- The product owner has a work plan that includes budget estimates and identifies funding sources
- The product owner has a strong relationship with the contracting officer

Key Questions

- Who is the product owner?
- What organizational changes have been made to ensure the product owner has sufficient authority over and support for the project?
- What does it take for the product owner to add or remove a feature from the service?

PLAY 7

Bring in experienced teams

We need talented people working in government who have experience creating modern digital services. This includes bringing in seasoned product managers, engineers, and designers. When outside help is needed, our teams should work

with contracting officers who understand how to evaluate third-party technical competency so our teams can be paired with contractors who are good at both building and delivering effective digital services. The makeup and experience requirements of the team will vary depending on the scope of the project.

Checklist

- Member(s) of the team have experience building popular, high-traffic digital services
- Member(s) of the team have experience designing mobile and web applications
- Member(s) of the team have experience using automated testing frameworks
- Member(s) of the team have experience with modern development and operations (DevOps) techniques like continuous integration and continuous deployment
- Member(s) of the team have experience securing digital services
- A Federal contracting officer is on the internal team if a third party will be used for development work
- A Federal budget officer is on the internal team or is a partner
- The appropriate privacy, civil liberties, and/or legal advisor for the department or agency is a partner

PLAY 8

Choose a modern technology stack

The technology decisions we make need to enable development teams to work efficiently and enable services to scale easily and cost-effectively. Our choices for hosting infrastructure, databases, software frameworks, programming languages and the rest of the technology stack should seek to avoid vendor lock-in and match what successful modern consumer and enterprise software companies would choose today. In particular, digital services teams should consider using open source, cloud-based, and commodity solutions across the technology stack, because of their widespread adoption and support by successful consumer and enterprise technology companies in the private sector.

Checklist

- Choose software frameworks that are commonly used by private-sector companies creating similar services
- Whenever possible, ensure that software can be deployed on a variety of commodity hardware types
- Ensure that each project has clear, understandable instructions for setting up a local development environment, and that team members can be quickly added or removed from projects

- Consider open source software solutions at every layer of the stack

Key Questions

- What is your development stack and why did you choose it?
- Which databases are you using and why did you choose them?
- How long does it take for a new team member to start developing?

PLAY 9

Deploy in a flexible hosting environment

Our services should be deployed on flexible infrastructure, where resources can be provisioned in real-time to meet spikes in traffic and user demand. Our digital services are crippled when we host them in data centers that market themselves as "cloud hosting" but require us to manage and maintain hardware directly. This outdated practice wastes time, weakens our disaster recovery plans, and results in significantly higher costs.

Checklist

- Resources are provisioned on demand
- Resources scale based on real-time user demand
- Resources are provisioned through an API
- Resources are available in multiple regions
- We only pay for resources we use
- Static assets are served through a content delivery network
- Application is hosted on commodity hardware

Key Questions

- Where is your service hosted?
- What hardware does your service use to run?
- What is the demand or usage pattern for your service?
- What happens to your service when it experiences a surge in traffic or load?
- How much capacity is available in your hosting environment?
- How long does it take you to provision a new resource, like an application server?
- How have you designed your service to scale based on demand?
- How are you paying for your hosting infrastructure (e.g., by the minute, hourly, daily, monthly, fixed)?
- Is your service hosted in multiple regions, availability zones, or data centers?

- In the event of a catastrophic disaster to a datacenter, how long will it take to have the service operational?
- What would be the impact of a prolonged downtime window?
- What data redundancy do you have built into the system, and what would be the impact of a catastrophic data loss?
- How often do you need to contact a person from your hosting provider to get resources or to fix an issue?

PLAY 10

Automate testing and deployments

Today, developers write automated scripts that can verify thousands of scenarios in minutes and then deploy updated code into production environments multiple times a day. They use automated performance tests which simulate surges in traffic to identify performance bottlenecks. While manual tests and quality assurance are still necessary, automated tests provide consistent and reliable protection against unintentional regressions, and make it possible for developers to confidently release frequent updates to the service.

Checklist

- Create automated tests that verify all user-facing functionality
- Create unit and integration tests to verify modules and components
- Run tests automatically as part of the build process
- Perform deployments automatically with deployment scripts, continuous delivery services, or similar techniques
- Conduct load and performance tests at regular intervals, including before public launch

Key Questions

- What percentage of the code base is covered by automated tests?
- How long does it take to build, test, and deploy a typical bug fix?
- How long does it take to build, test, and deploy a new feature into production?
- How frequently are builds created?
- What test tools are used?
- Which deployment automation or continuous integration tools are used?
- What is the estimated maximum number of concurrent users who will want to use the system?
- How many simultaneous users could the system handle,

according to the most recent capacity test?
- How does the service perform when you exceed the expected target usage volume? Does it degrade gracefully or catastrophically?
- What is your scaling strategy when demand increases suddenly?

PLAY 11

Manage security and privacy through reusable processes

Our digital services have to protect sensitive information and keep systems secure. This is typically a process of continuous review and improvement which should be built into the development and maintenance of the service. At the start of designing a new service or feature, the team lead should engage the appropriate privacy, security, and legal officer(s) to discuss the type of information collected, how it should be secured, how long it is kept, and how it may be used and shared. The sustained engagement of a privacy specialist helps ensure that personal data is properly managed. In addition, a key process to building a secure service is comprehensively testing and certifying the components in each layer of the technology stack for security vulnerabilities, and then to re-use these same pre-certified components for multiple services.

The following checklist provides a starting point, but teams should work closely with their privacy specialist and security engineer to meet the needs of the specific service.

Checklist

- Contact the appropriate privacy or legal officer of the department or agency to determine whether a System of Records Notice (SORN), Privacy Impact Assessment, or other review should be conducted
- Determine, in consultation with a records officer, what data is collected and why, how it is used or shared, how it is stored and secured, and how long it is kept
- Determine, in consultation with a privacy specialist, whether and how users are notified about how personal information is collected and used, including whether a privacy policy is needed and where it should appear, and how users will be notified in the event of a security breach
- Consider whether the user should be able to access, delete, or remove their information from the service
- "Pre-certify" the hosting infrastructure used for the project using FedRAMP
- Use deployment scripts to ensure configuration of production environment remains consistent and controllable

Key Questions

- Does the service collect personal information from the user? How is the user notified of this collection?
- Does it collect more information than necessary? Could the data be used in ways an average user wouldn't expect?
- How does a user access, correct, delete, or remove personal information?
- Will any of the personal information stored in the system be shared with other services, people, or partners?
- How and how often is the service tested for security vulnerabilities?
- How can someone from the public report a security issue?

PLAY 12

Use data to drive decisions

At every stage of a project, we should measure how well our service is working for our users. This includes measuring how well a system performs and how people are interacting with it in real-time. Our teams and agency leadership should carefully watch these metrics to find issues and identify which bug fixes and improvements should be prioritized. Along with monitoring tools, a feedback mechanism should be in place for people to report issues directly.

Checklist

- Monitor system-level resource utilization in real time
- Monitor system performance in real-time (e.g. response time, latency, throughput, and error rates)
- Ensure monitoring can measure median, 95th percentile, and 98th percentile performance
- Create automated alerts based on this monitoring
- Track concurrent users in real-time, and monitor user behaviors in the aggregate to determine how well the service meets user needs
- Publish metrics internally
- Publish metrics externally
- Use an experimentation tool that supports multivariate testing in production

Key Questions

- What are the key metrics for the service?
- How have these metrics performed over the life of the service?
- Which system monitoring tools are in place?
- What is the targeted average response time for your service? What percent of requests take more than 1 second, 2 seconds, 4 seconds, and 8 seconds?
- What is the average response time and percentile

breakdown (percent of requests taking more than 1s, 2s, 4s, and 8s) for the top 10 transactions?
- What is the volume of each of your service's top 10 transactions? What is the percentage of transactions started vs. completed?
- What is your service's monthly uptime target?
- What is your service's monthly uptime percentage, including scheduled maintenance? Excluding scheduled maintenance?
- How does your team receive automated alerts when incidents occur?
- How does your team respond to incidents? What is your post-mortem process?
- Which tools are in place to measure user behavior?
- What tools or technologies are used for A/B testing?
- How do you measure customer satisfaction?

PLAY 13

Default to open

When we collaborate in the open and publish our data publicly, we can improve Government together. By building services more openly and publishing open data, we simplify the public's access to government services and information, allow the public to contribute easily, and enable reuse by entrepreneurs, nonprofits, other agencies, and the public.

Checklist

- Offer users a mechanism to report bugs and issues, and be responsive to these reports
- Provide datasets to the public, in their entirety, through bulk downloads and APIs (application programming interfaces)
- Ensure that data from the service is explicitly in the public domain, and that rights are waived globally via an international public domain dedication, such as the "Creative Commons Zero" waiver
- Catalog data in the agency's enterprise data inventory and add any public datasets to the agency's public data listing
- Ensure that we maintain the rights to all data developed by third parties in a manner that is releasable and reusable at no cost to the public
- Ensure that we maintain contractual rights to all custom software developed by third parties in a manner that is publishable and reusable at no cost
- When appropriate, create an API for third parties and internal users to interact with the service directly
- When appropriate, publish source code of projects or components online
- When appropriate, share your development process and progress publicly

Key Questions

- How are you collecting user feedback for bugs and issues?
- If there is an API, what capabilities does it provide? Who uses it? How is it documented?
- If the codebase has not been released under an open source license, explain why.
- What components are made available to the public as open source?
- What datasets are made available to the public?

Custody Information Management

Recommendations and Requirements for Integrated System Development

Version 4
Prepared by Pas de Chocolat, LLC
Prepared for Nolan Espinda, Director, Department of Public Safety and
Jodie Maesaka-Hirata, Deputy Director of Corrections, Department of Public Safety
Shari Kimoto, TA Institutions Division Administrator, Department of Public Safety

Jan 2019

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CURRENT STATE

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[redacted]

FUTURE STATE RECOMMENDATIONS 27

[redacted]

[redacted]

NEXT STEPS 39

[redacted]

Custody Information Management Recommendations & Requirements *continued*

INTRODUCTION

Purpose

The purpose of this document is to describe the business requirements and recommendations for the foundation of a Custody Information Management System (CIMS) in a technology-independent manner, using general business and/or Department of Public Safety (PSD) operations terminology in the representation of requirements.

This document provides guidance for additional research, design, application development, and change management activities in addition to future software decisions towards building out the desired CIMS. Note that information contained is based on qualitative research activities from 2014 to 2018. There have been numerous changes through the period from data collection to the writing and publishing of this document. Where possible, changes were made to reflect those changes. The responsibility for the interpretation and use of this material lies with the reader. Pas de Chocolat shall not be liable for damages arising from its use.

Audience

This document is written for PSD's Director, Deputy Director of Corrections, and administrators that perform IT governance roles. It is designed to be accessible, readable and actionable by executive, management and project management functions.

[redacted]

[redacted]

Custody Information Management Recommendations & Requirements *continued*

CURRENT STATE

The following is a review of the collection of systems that tracks and manages custody information in support of the department's corrections-related operations.

[redacted]

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[redacted]

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Custody Information Management Recommendations & Requirements *continued*

Context of Operations

The coordination of operations within the Corrections Division is only part of the operational needs. PSD is required to coordinate operations with other agencies and providers. The following is an overview of corrections operations to include non-Corrections Division stakeholders and the types of information sharing that are required for corrections operations performance.

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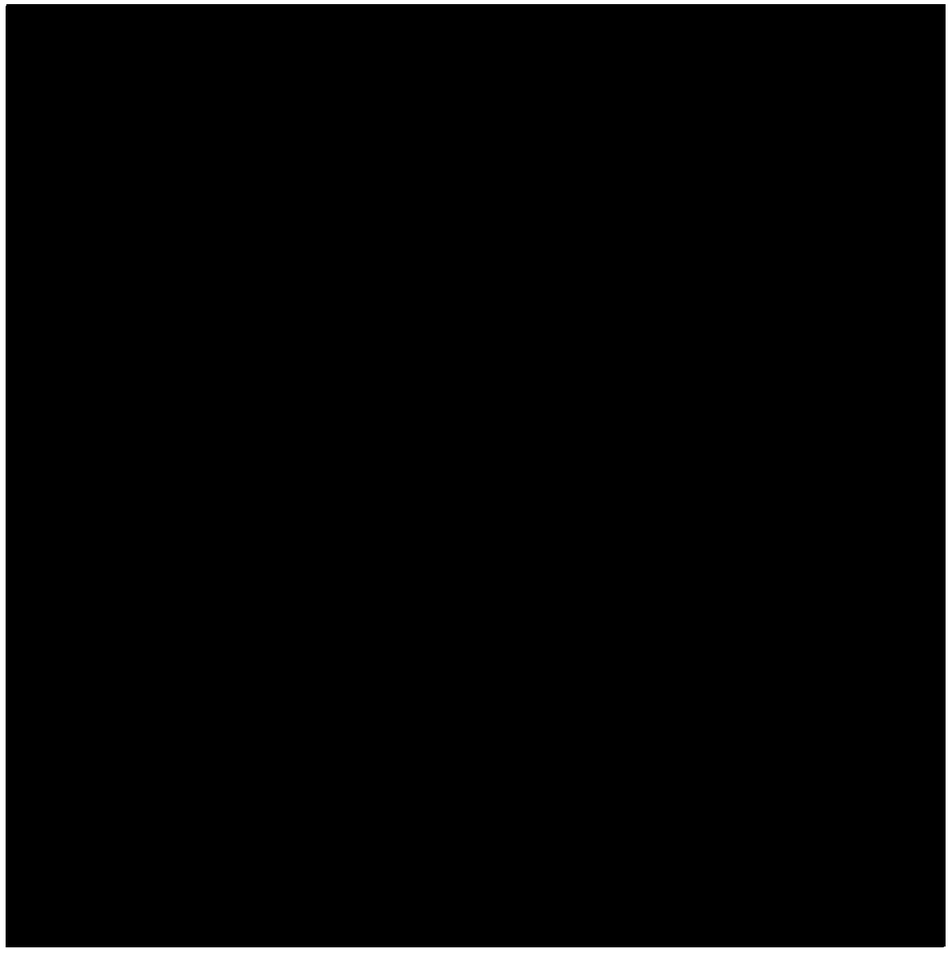
Existing Data Systems

The following are the primary database and paper systems with their known integrations that represent the most standardized elements and processes of the data infrastructure. Some of these systems are owned by other agencies and is supported in house and by vendors as shown.



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Custody Information Management Recommendations & Requirements *continued*

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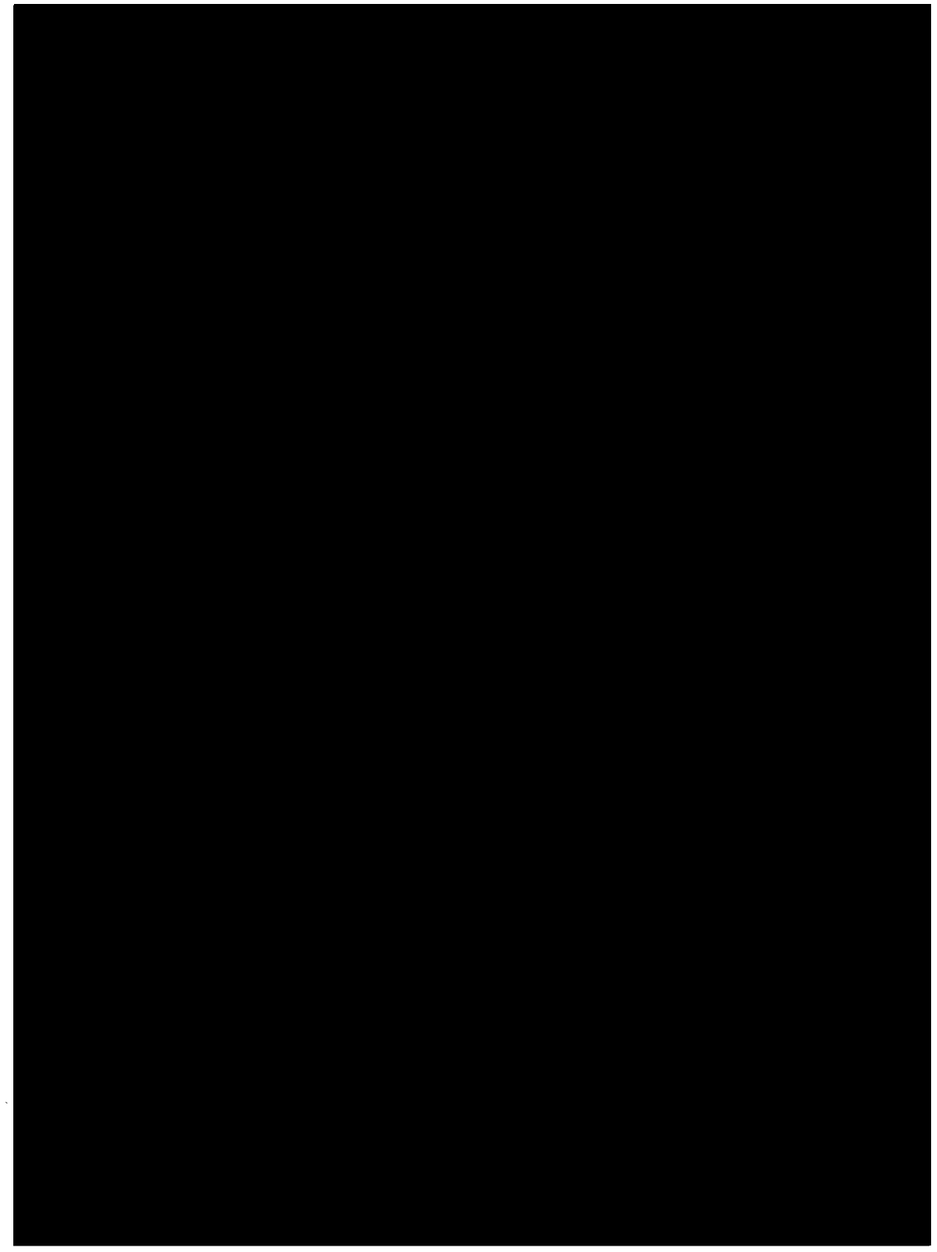
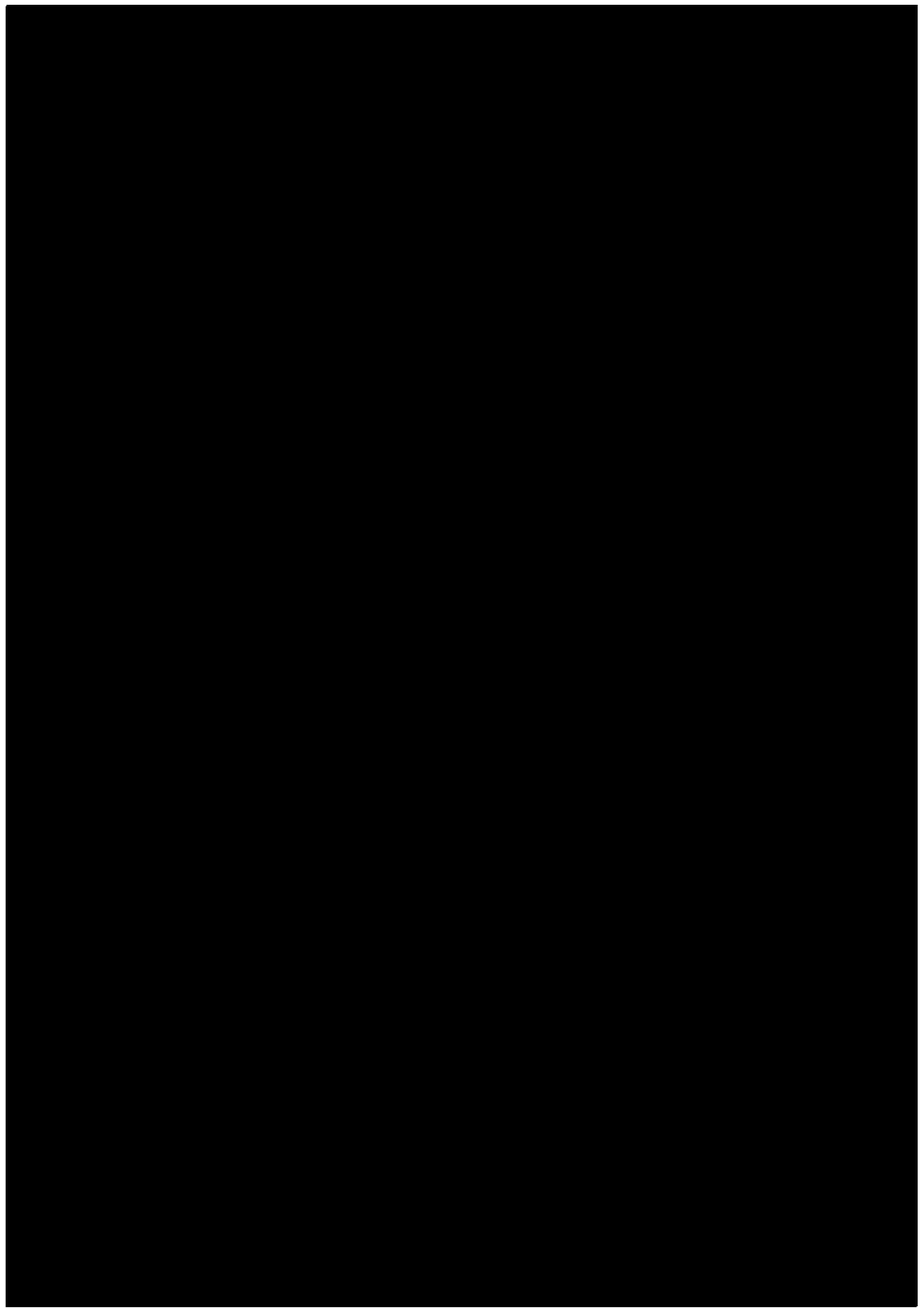
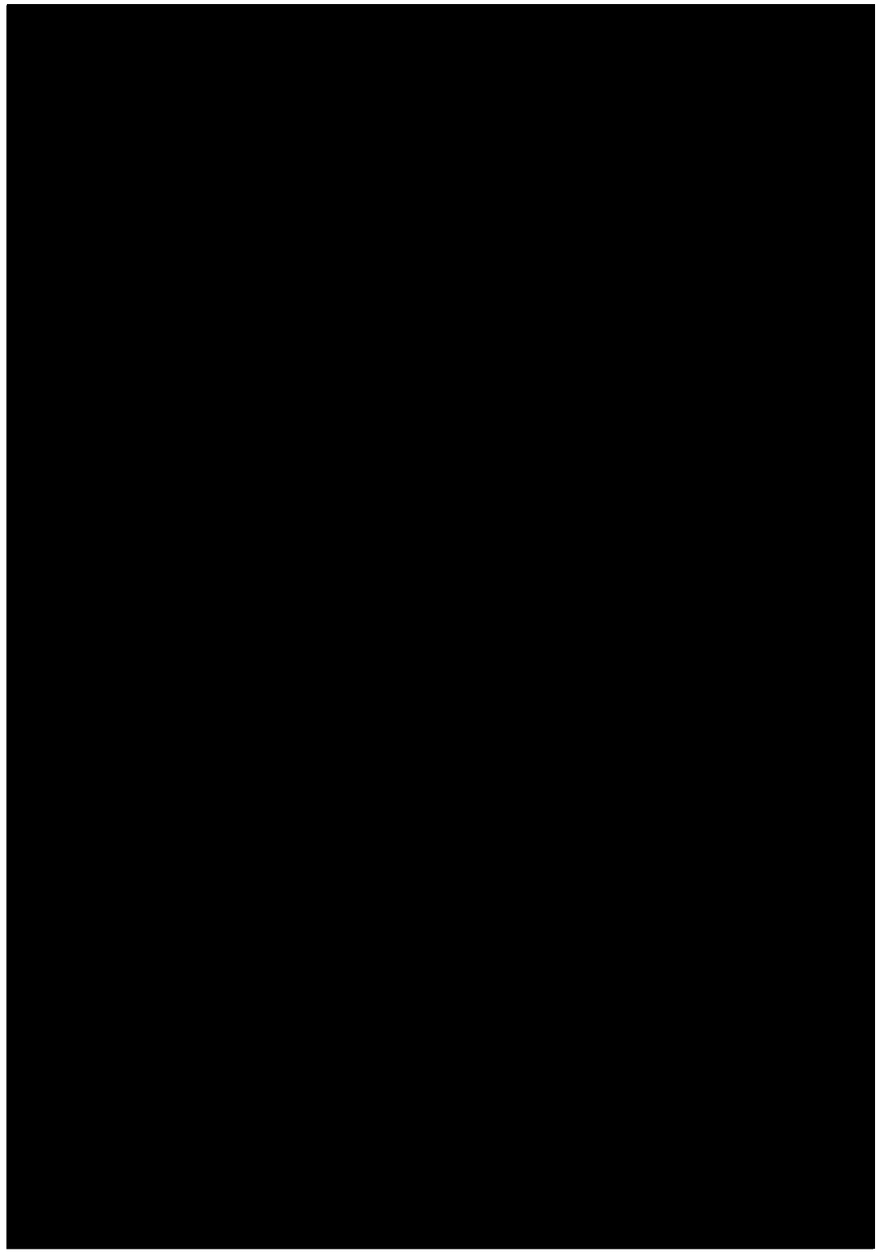
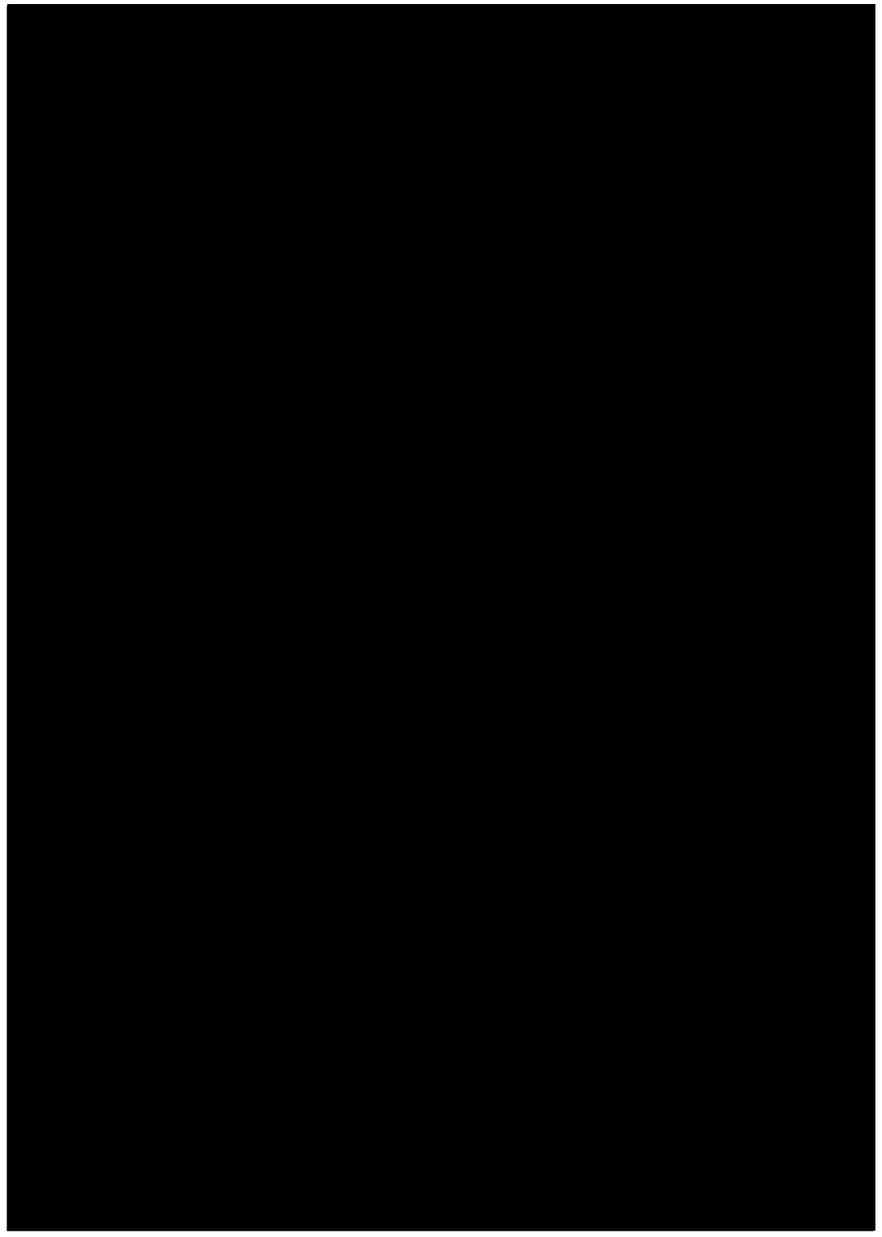
Custody Information Management Recommendations & Requirements *continued*





Custody Information Management Recommendations & Requirements *continued*





Custody Information Management Recommendations & Requirements *continued*

[redacted]

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Stakeholders

Because of the broad scope of the project, there are many stakeholders that may have vested interest in different parts of the project. Consider the following groups when defining project teams and stakeholders for input and decision-making.

[redacted]

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Custody Information Management Recommendations & Requirements *continued*

[redacted]

[redacted]

Custody Information Management Recommendations & Requirements *continued*

Assumptions and Constraints

The following assumptions and constraints provide some of the context of the umbrella CIMS project and may impact the shaping of the requirements and recommendations for each sub project. Changes in these areas would likely change opportunities and risks for the project.

[redacted]

[redacted]

Custody Information Management Recommendations & Requirements *continued*

[redacted]

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[redacted]

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Custody Information Management Recommendations & Requirements *continued*

[redacted]

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[redacted]

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Custody Information Management Recommendations & Requirements *continued*

FUTURE STATE RECOMMENDATIONS

The following represents recommendations for the desired outcome of the CIMS project.

[redacted]

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[redacted]

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Custody Information Management Recommendations & Requirements *continued*

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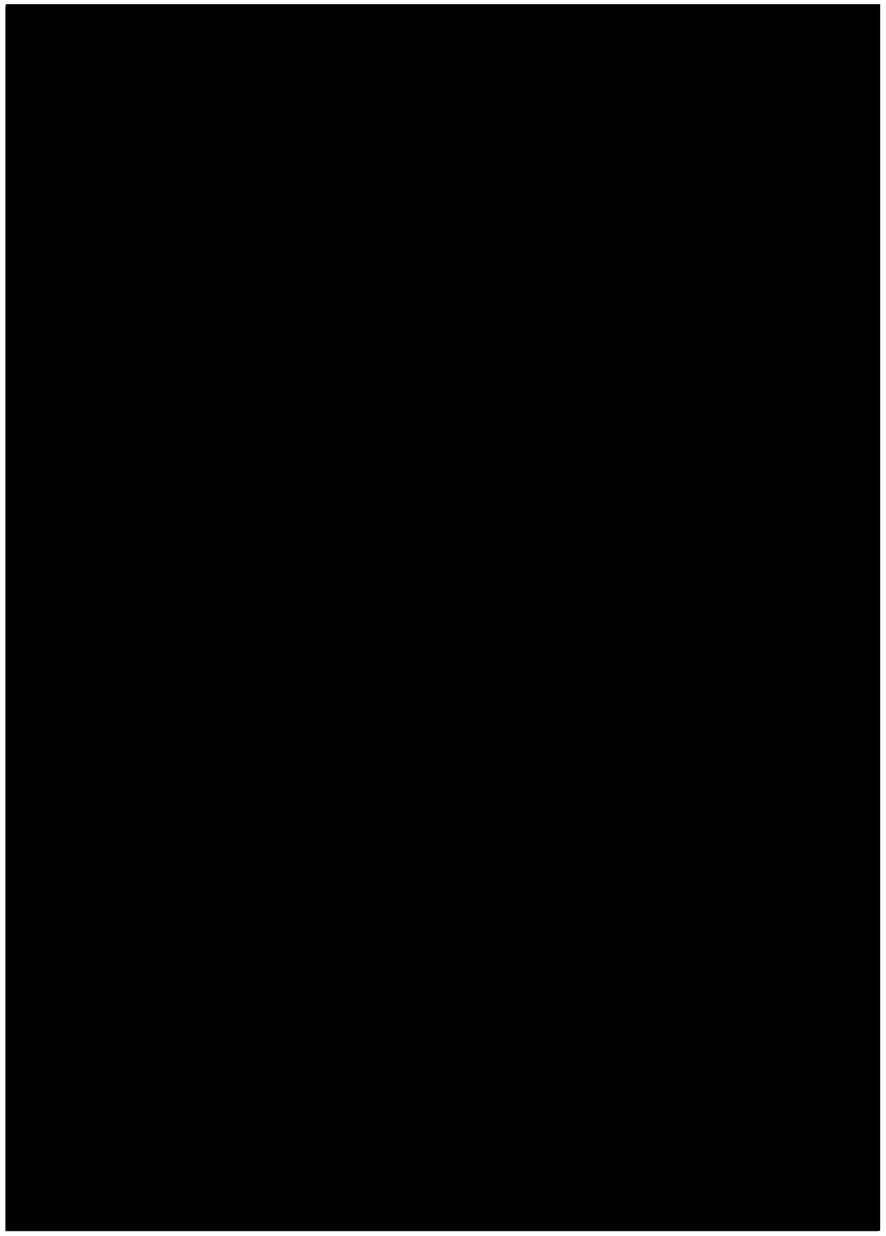

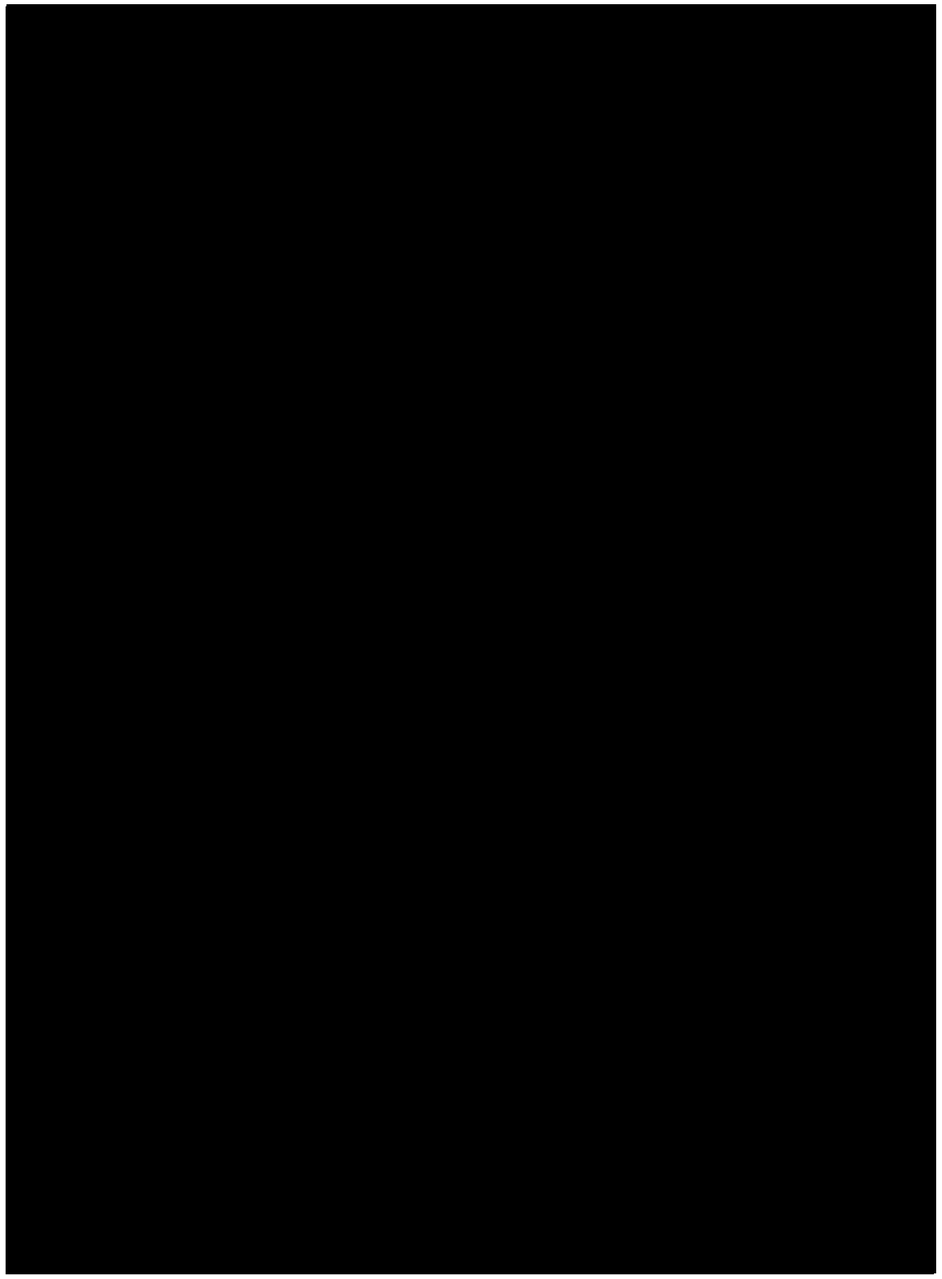

Custody Information Management Recommendations & Requirements *continued*

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Custody Information Management Recommendations & Requirements *continued*

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Custody Information Management Recommendations & Requirements *continued*

Custody Information Management Recommendations & Requirements *continued*

[redacted]

NEXT STEPS

To get to starting on the CIMS will require work to develop an IT foundation first — IT governance, IT management, an IT strategy and core IT policies. What is provided in this document is one example and perspective of how to model IT for Corrections. Once the department is ready to start the CIMS, the first step will be to identify and prioritize the opportunities.

[redacted]

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[redacted]

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Custody Information Management Recommendations & Requirements *continued*

Digital maturity is a process

Creating policies and standardized processes are necessary for the development of clarity for operations requirements. To reiterate, the recommendations provided in this document are for a future vision that is reliant on the development of many other capabilities. Use this for information, inspiration and guidance when you are ready but focus on taking the next, small step, first.

Transportation Dashboard

Department of Public Safety
Data Infrastructure Improvement Project

Transportation Dashboard: A Case Study for Developing IT Governance and Management Capabilities

The following documents the Transportation Dashboard Modernization Project, a transformational IT small project component of the Data Infrastructure Improvement Project.

ALL INFORMATION CONTAINED WITHIN THIS DOCUMENT IS CONFIDENTIAL TO THE DEPARTMENT OF PUBLIC SAFETY AND THE HAWAII STATE JUDICIARY.

Submitted to:
Department of Public Safety, State of Hawaii
Nolan Espinda, Director
Renee Sonobe-Hong, Deputy Director of Law Enforcement
Jodie Maesaka-Hirata, Deputy Director of Corrections

Research and Evaluation in Public Safety Project, RCUH
Ed Suarez, Principal Investigator

pas de chocolat
January 2019

Overview

A prototype Custody Transportation Dashboard was built for a process improvement project sponsored by the Hawaii Community Foundation in the winter of 2013-2014. The purpose was to facilitate timely transfer of custodies from Oahu Community Correctional Center (OCCC) to First Circuit Court. The prototype replaced First Circuit Cell Block's Excel spreadsheet with a web application to be used as an operations dashboard within Cell Block and for communicating transport needs with OCCC. It also provided the courts with transport arrival information and Oahu Intake Service Center with advance notice on new intakes. The prototype has been in daily use since deployment in early 2014.

In 2017, an opportunity to more fully develop the dashboard became available through the Data Infrastructure Improvement Project as a means to evaluate the IT governance and management capabilities of the Department. The opportunity arose as the judiciary was in the process of finalizing [redacted] at First Circuit Court. Digital calendars were desired for the dashboard prototype but inquiries into [redacted] The new rollout led to the revisiting of the discussion of a Judiciary-Public Safety integration with [redacted] court calendars for the criminal courts.

The primary purpose [redacted] was to provide Public Safety with court information more directly and in a more timely manner. Paper processes and manual entry were to be minimized — used for exceptions and back-up processes only. The project hoped to underscore the value of sharing information and responsibility for developing well-managed criminal justice processes.

[redacted]

Transportation Dashboard *continued*

Improvements

[redacted]

[redacted]

[redacted] allows for a faster relay of data between all stakeholders. Cell block deputies have less manual entry of data. OCCC is provided with more information [redacted] and earlier in their work day, improving the efficiency and timeliness of their review and identification process. [redacted]

Other feature updates include:

[redacted]

- a new view for the attorneys and public defenders to check on the arrival status of their custodies at cell block, and
- minor application updates to improve general usability.

[redacted]

Project Planning

The project started by engaging in discussions with the Judiciary [redacted] The initial meetings were informational [redacted]

From the outset, engagement at the executive level was required to help manage negotiations and voice concerns on behalf of the Department. An IT governing body would have been ideal to discuss needs across the department [redacted] Our small project constraints limited the discussion to focus on the needs for a single user group. However, in the ideal scenario, the Department would consider all aspects of department needs and negotiate to address all needs [redacted] This is the kind of shared technical and operational decision-making responsibility that will quickly become the norm for modern software projects.

Requirements Development

[redacted] provided strategic direction for the project. The vision was to have a streamlined, paperless process in which judiciary was accountable for the data provided to PSD and cell block to be held accountable for providing appropriate services and OCCC accountable for transporting the right individuals in a timely manner. The goal was to have First Circuit Court users providing standardized calendars through a mostly digital, paperless process.

The functional requirements were developed by Pas de Chocolat based on previous process research that involved the First Circuit Courts, First Circuit Cell Block and OCCC's Module 5 operations. New information was provided by the Dep-E on court operations and additional interviews and a stakeholder meeting were conducted by Pas de Chocolat with users from First Circuit cell block and OCCC respectively.

Constraints were discussed [redacted] and the Dep-E was kept informed for additional decision-making needs.

Once development requirements [redacted] were determined the project moved towards design activities.

Design Phase

Executive engagement was required through this stage as process ownership became a question. The design phase became an extension of the requirements phase as new issues were identified once test data was received. Assumptions were identified that needed to be addressed and issues identified [redacted] needed to be resolved. [redacted] Transparency of that process and inability to have direct discussions at the executive, decision-making level made the design phase more difficult as without concrete decisions, design decisions couldn't be made. Issues were eventually closed although many were addressed with workarounds and were left uncertain as to final accountability.

Transportation Dashboard *continued*

Once these specifications were set, design activities could begin. [redacted]

Mockups were created to provide means for discussions with end users. Review of the mockups provided prompts for getting user input and identifying potential issues [redacted]

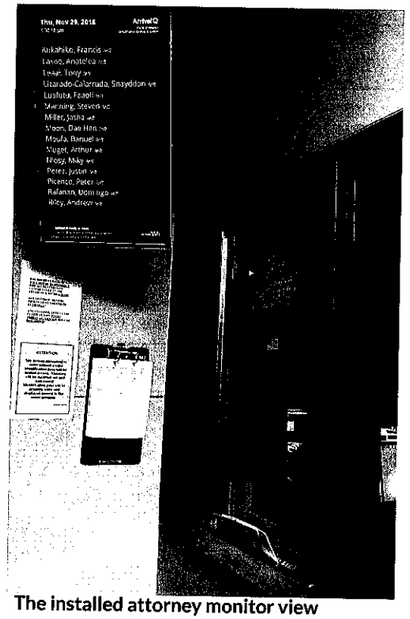
In the interim, we wanted to rollout a less development-intensive feature — a view for attorneys outside of cell block. It would be an opportunity to evaluate the challenges of implemeting a hardware/software solution in this mixed physical space. [redacted]

The attorney window view was built to leverage existing data and reduce interruptions for the cell block desk person by making arrival status visible to the visiting attorneys. The concept was likened to an airport arrivals and departures screen. A design was made and tested and mounting hardware and a computer monitor were ordered. The challenges arose with the question of how to install the monitor in the space and whose IT protocols were to be followed. [redacted]

We performed the necessary end-to-end troubleshooting and made final hardware changes and identified other general setup risks to adress.

The window, initially expected to be a very small project, proved that coordinating operations across agencies required continuous communication, verification, problem ownership accountability, policy negotiations and a lot of patience. Project management is required.

Once installed, we returned and observed use over consecutive visits to ensure that it was



The installed attorney monitor view

working as desired. Other minor issues of use were identified and incrementally adjusted to better suit user needs. The attorney window view was then considered completed.

Upon completion of the installation, we refocused on moving forward on [redacted] Again, project management was required to monitor and ensure [redacted] communicated.

On the design side, mockups were refined for more specific layout considerations and development could begin.

Development Phase

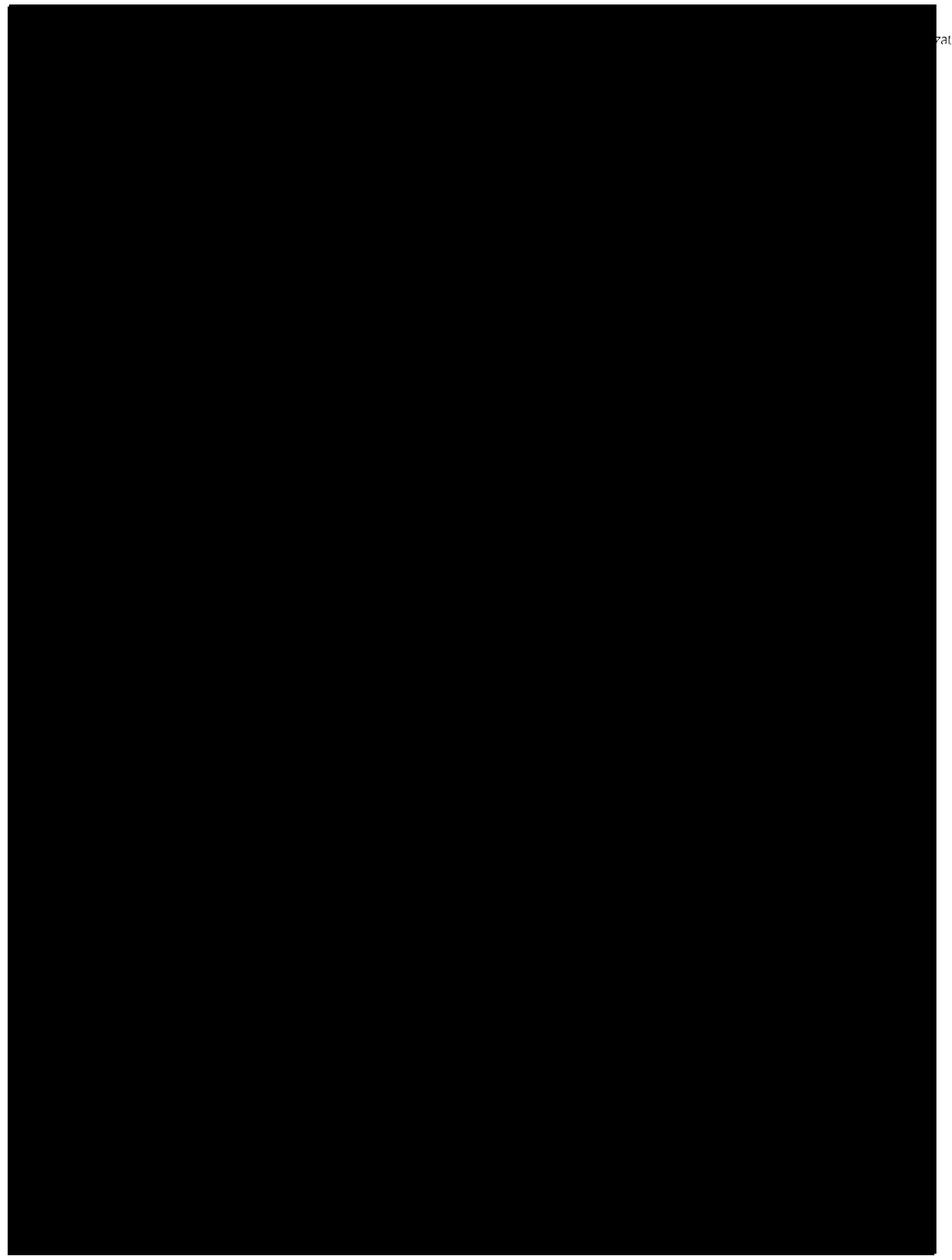
The development was technically an ongoing activity since it was planned for staged deployment that included a software update. The software update, being a solely technical activity, could be done without much consultation and while time intensive, was lower effort, requiring less negotiation and invisible to users. [redacted]

Development moved through stages with user testing rollout to ensure that requirements were being met and necessary fixes could be made to make the project viable with each iteration. All issues were communicated in case it turned out to be a larger issue but overall, most issues were able to be addressed in a manner that did not significantly affect overall usability.

In this stage, much of the time was spent with end users to observe and identify issues with testing. Hands-on setup and individual walk-through are an essential means for gaining quick insights and clear feedback. Significant support from executive management and administrative process owners were required to assist in identifying, prioritizing and directing action for risks. The more engaged all parties were, the faster the development cycle.

In the end, the project came to a close just as the testgroup rollout was completed. The project provided an unexpectedly rich source of examples to demonstrate the need for IT governance, IT management and general project management capabilities. It engaged all three divisions, law enforcement, corrections and administration and developed new insight into interagency project management challenges. MIS was required to participate through delivery of hardware, networking, shared infrastructure, application and desktop support. It was a means to develop skills and get a useful product outcome.

Transportation Dashboard *continued*



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Case Notes Database Mockups

Department of Public Safety
Data Infrastructure Improvement Project

Case Notes Database: The Process of Developing a Software Tool to Replace a Paper-Based System

The following documents the Case Notes Database project process, a small software development project under the Data Infrastructure Improvement Project.

ALL INFORMATION CONTAINED WITHIN THIS DOCUMENT IS CONFIDENTIAL TO THE DEPARTMENT OF PUBLIC SAFETY AND THE HAWAII STATE JUDICIARY.

Submitted to:
Department of Public Safety, State of Hawaii
Nolan Espinda, Director
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Research and Evaluation in Public Safety Project, RCUH
Ed Suarez, Principal Investigator

pas de chocolat
January 2019

Case Notes Database Mockups

Process Narrative

To better understand the challenges of developing a software product based on non-digital processes, the Data Infrastructure Improvement Project took on the development of a prototype case notes database.

The intent was to support work furlough processes. To keep research and development efforts contained, we asked for a small test group. Deputy Directors selected the Bridge population at WCCC for the most appropriate use case. Within the research process, the challenges faced by work furlough stemmed from the basic lack of technology support for case management processes. In order to develop something for work furlough, it was recommended that a basic case management system should be the starting point.
To identify the opportunity for largest impact for

[redacted]

Although the considerations took into account a broader view, we also focused on the rollout considerations and opportunities presented by the smaller user group.

WCCC was an appropriate selection from a project standpoint as the case management group and records facilities were readily observable and with a smaller furlough program enrollment. Institutional files were reviewed for work furlough cases. We conducted detailed research into case management work flow processes, responsibilities and artifacts were gathered. We reviewed process flows to clarify basic needs and identified that the [redacted] was the most standardized base process from which a case management database could be modeled. Once we had clarified our project objectives, we reached

[redacted]

From that point forward, additional research with stakeholders were required to determine the application's functional requirements. For example, information workflows, data specifications, timing and notifications were reviewed. Possible process and context

[redacted]

Basic functionality was scoped to the primary case man

[redacted]

opment work. To date, the application is now partway through the development phase. Basic application structure and functionalities have been created. Form creation and user interface detailed design have not been started.

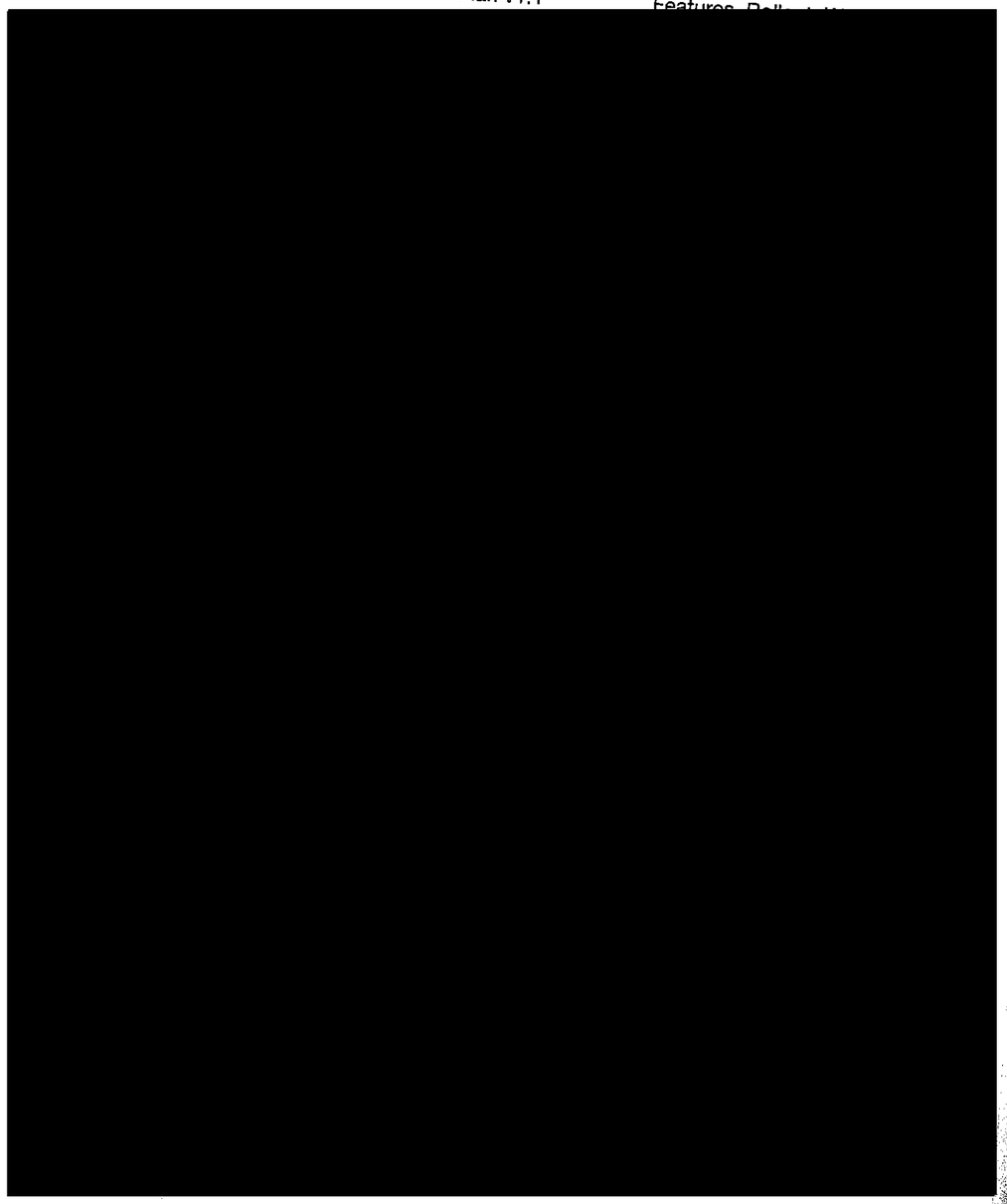
A copy of the application to date is being submitted to PSD along with this report.

Case Notes Database Mockups *continued*

Plan

Case Notes Database

Plan v1.1



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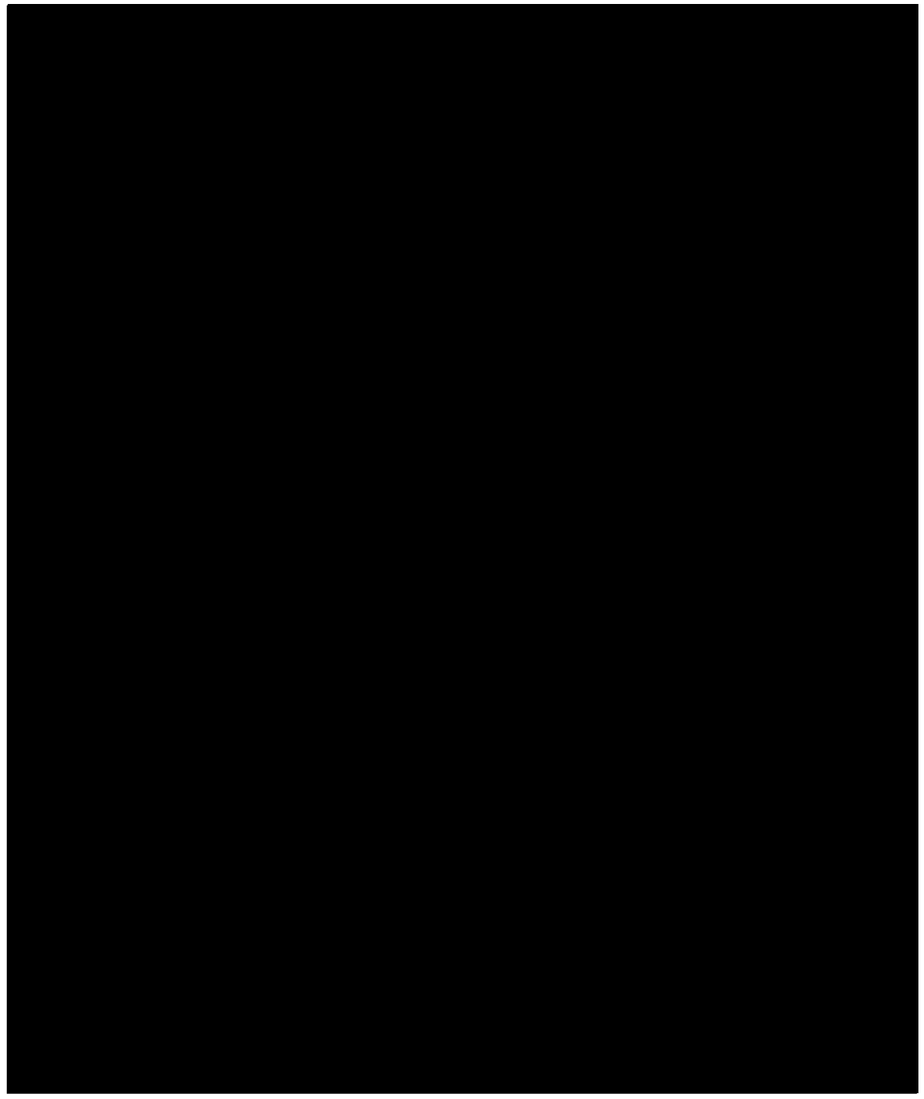
Version 1

Case Notes Database v1

Pas de Chocolat



Wednesday, July 19, 2017

C. Oba

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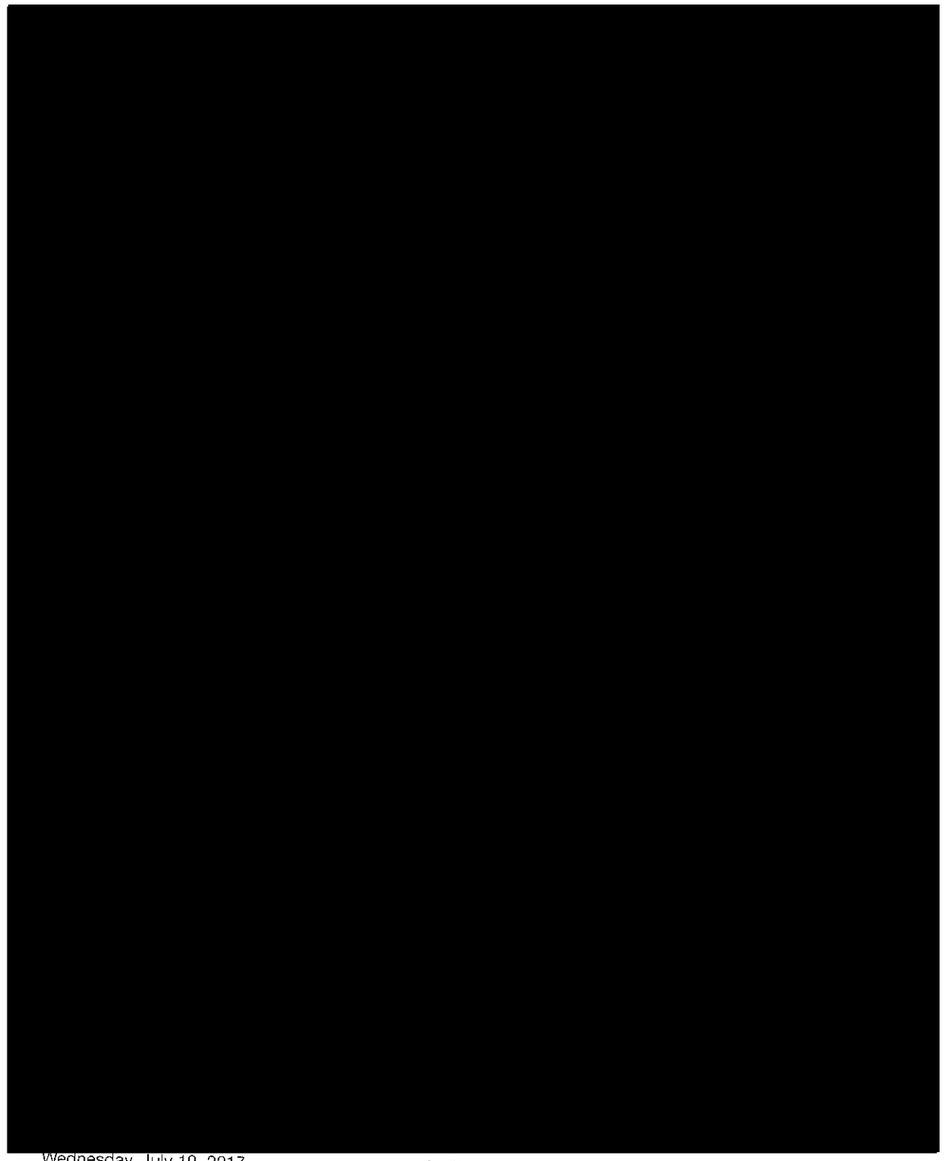
Case Notes Database Mockups *continued*

Version 1 *continued*

Case Notes Database v1

Pas de Chocolat



Wednesday, July 19, 2017

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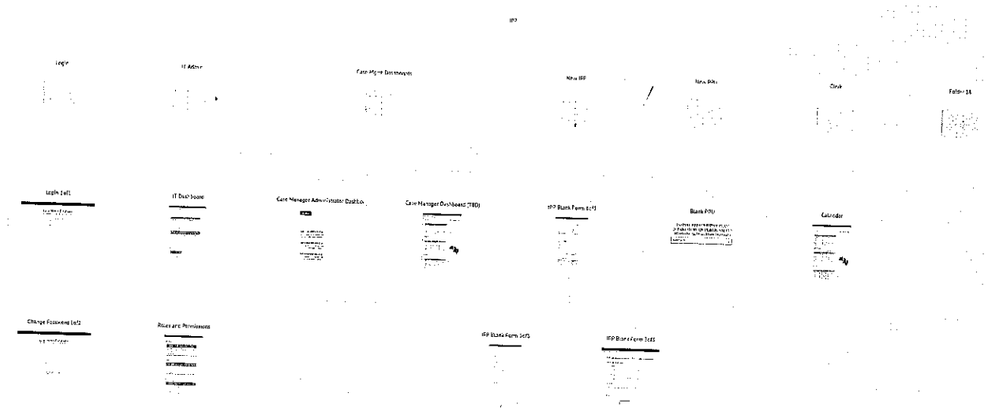
Site map



Case Notes Database Mockups *continued*

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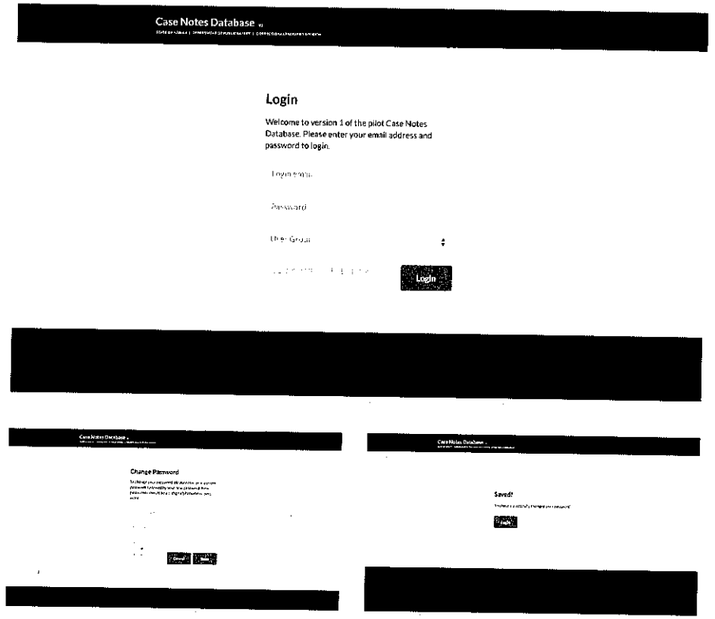


[redacted]

[redacted]

[redacted]

[redacted]

Users

	USER LOGIN	ROLE	
	first.lastname@hawaii.gov	Case Manager	
	First and Lastname	Primary Facility, Title 808-911-2222	
+	first.lastname@hawaii.gov	Case Management Supervisor	
+	first.lastname@hawaii.gov	Case Manager	
+	first.lastname@hawaii.gov	Clerk	
+	first.lastname@hawaii.gov	IT Admin	
+	first.lastname@hawaii.gov	Administrator, Editor	
+	first.lastname@hawaii.gov	Administrator, Reviewer	

User Profile

LOGIN EMAIL

NAME

FACILITY (IF MULTIPLE, SELECT DEFAULT) ROLE PHONE

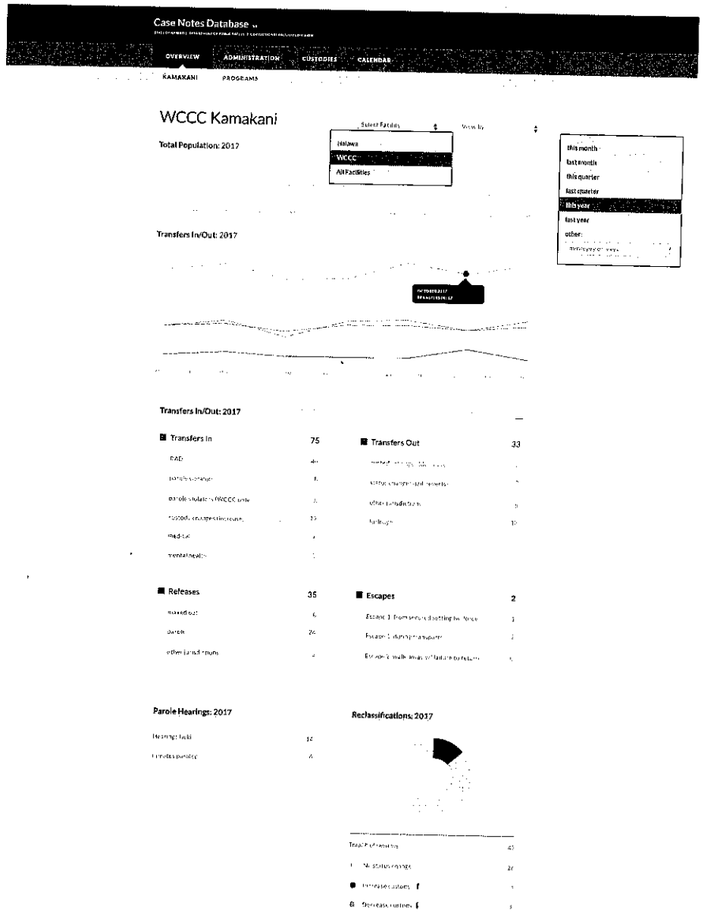
WCCC

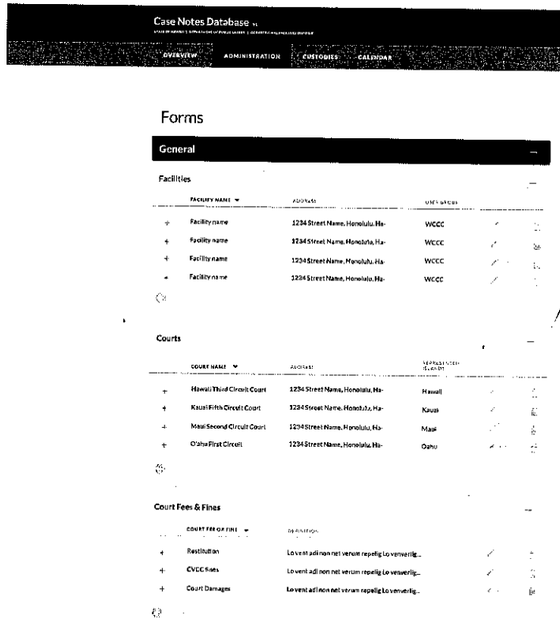
IT Admin
Administrative Reviewer
Administrative Editor
Case Management Supervisor
Case Manager
Clerk

Cancel Save

Case Notes Database Mockups *continued*

[redacted]





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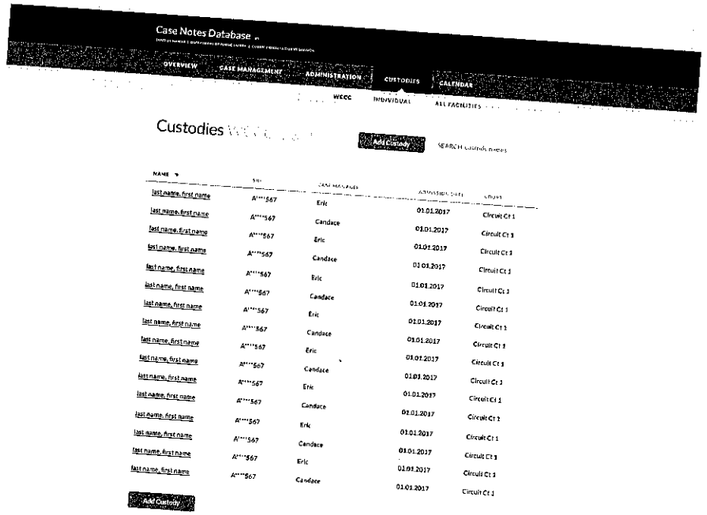
Case Notes Database Mockups *continued*

[redacted]



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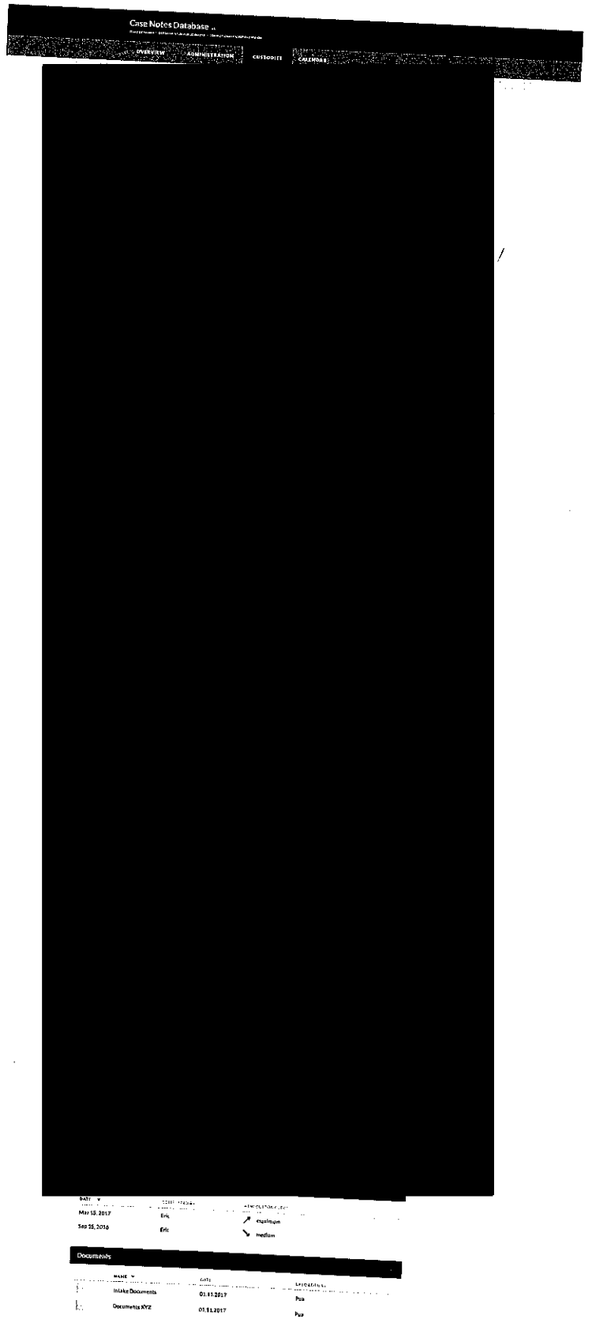
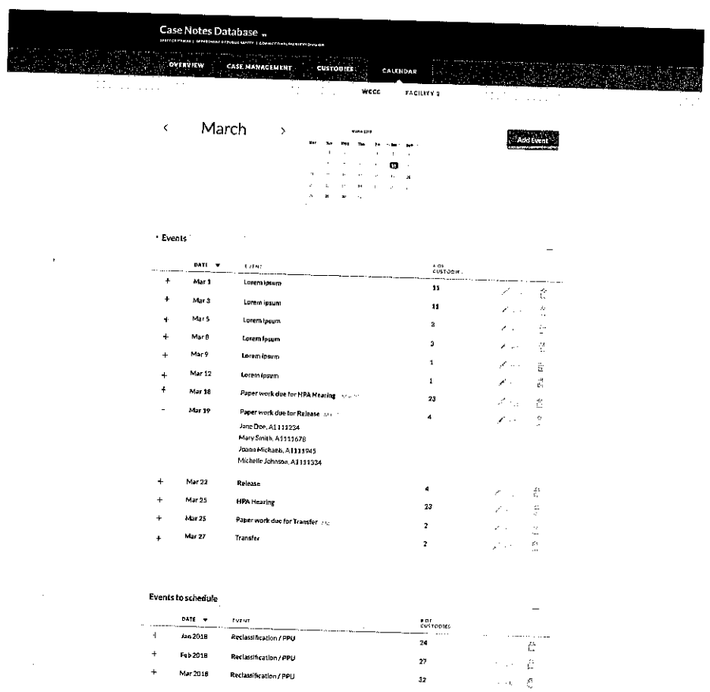


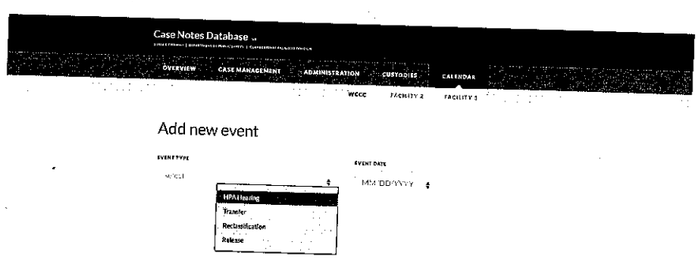
Case Notes Database Mockups *continued*

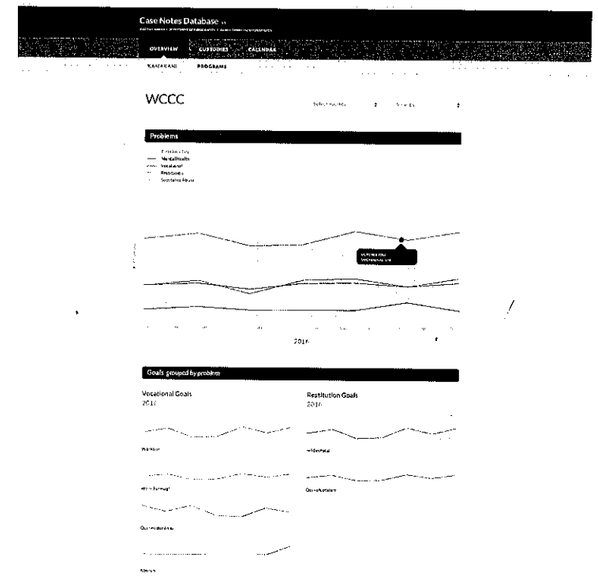
[redacted]

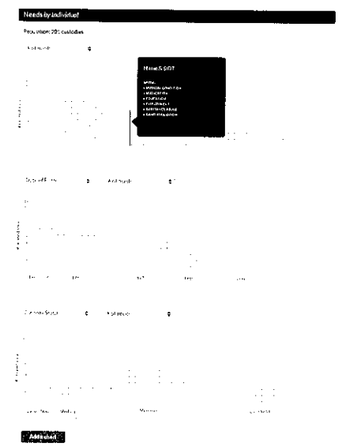
Search Results:

NAME	SID	FACILITY	ADMISSION DATE	CASE MANAGER	COURT
last name, Keala	A****567	WCCC	01.09.2017	Eric	Circuit Ct 1
last name, Keala	A****567	WCCC	01.01.2017	Candace	Circuit Ct 1
Kealani, first name	A****567	Halawa	01.01.2017	Mike	Circuit Ct 3
Kealani, first name	A****567	MCCC	01.01.2017	Ed	Circuit Ct 3
last name, Loikaula	A****567	Halawa	05.01.2017	Mike	Circuit Ct 5









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Case Notes Database Mockups *continued*

[redacted]

Case Notes Database

OVERVIEW | CASE MANAGEMENT | ADMINISTRATION | CUSTODIES | CALENDAR

WCCC | MY CASE LOAD

WCCC Case Load

< March >

DATE	EVENT	# OF CASE NOTES
Mar 1	Lorem ipsum	11
Mar 9	Lorem ipsum	1
Mar 12	Lorem ipsum	1
Mar 18	Paper work due for HPA Hearing	23
Mar 19	Paper work due for Release	4
Mar 9	Lorem ipsum	1
Mar 12	Lorem ipsum	1
Mar 12	Lorem ipsum	1
Mar 12	Lorem ipsum	1

Case Load March 2017

LAST MANAGED	90	PSH	RECLASS PENDING	TRANSFER PACK	RELEASE PLANNED
Eric 1900	00 / 00	00 / 00	00 / 00	00 / 00	00 / 00
Candace 96	00 / 00	00 / 00	00 / 00	00 / 00	00 / 00
TOTAL	00 / 00	00 / 00	00 / 00	00 / 00	00 / 00

IPP March 2017

new IPPs assigned

SELECT	NAME	DUE DATE	ASSIGNED TO
☐	last name, first name	05.02.2017	Eric
☑	last name, first name	12.02.2016	Eric
☐	last name, first name	05.02.2017	Candace

Reassign

IPPs in progress

SELECT	NAME	DUE DATE	ASSIGNED TO
☐	a last name, first name	01.02.2017	Eric
☐	b last name, first name	01.02.2017	Eric
☐	c last name, first name	01.02.2017	Candace
☐	d last name, first name	01.02.2017	Candace

Reassign

IPPs completed

SELECT	NAME	STATUS	DATE OF STATUS UPDATE	PPS
☐	last name, first name	PED received	03.16.2017	04.2016
☐	last name, first name	IPP completed	03.16.2017	
☐	last name, first name	sent to HPA	03.15.2017	
☐	last name, first name	sent to HPA	03.10.2017	

Change Status

PPU March 2017

new PPUs assigned

SELECT	NAME	DUE DATE	ASSIGNED TO
☐	last name, first name	05.02.2017	Eric
☐	last name, first name	12.02.2016	Eric
☐	last name, first name	05.02.2017	Candace

Reassign

PPUs in progress

SELECT	NAME	DUE DATE	ASSIGNED TO
☐	a last name, first name	01.02.2017	Eric
☐	b last name, first name	01.02.2017	Eric

Case Notes Database

OVERVIEW | CASE MANAGEMENT | ADMINISTRATION | CUSTODIES | CALENDAR

WCCC | MY CASE LOAD

My Case Load

< March >

DATE	EVENT	# OF CASE NOTES
Mar 1	Lorem ipsum	11
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Mar 12	Lorem ipsum	1
Mar 12	Lorem ipsum	1

IPP March 2017

IPPs completed

SELECT	NAME	STATUS	DATE OF STATUS UPDATE	PPS
☐	last name, first name	PED received	03.16.2017	04.2016
☐	last name, first name	IPP completed	03.16.2017	
☐	last name, first name	sent to HPA	03.15.2017	
☐	last name, first name	sent to HPA	03.10.2017	

Change Status

PPU March 2017

PPUs completed

SELECT	NAME	STATUS	DATE OF STATUS UPDATE	NEEDS CLASSIFICATION
☐	last name, first name	Decision received	03.16.2017	◯ Yes ◯ No
☐	last name, first name	PPU completed	03.16.2017	
☐	last name, first name	sent to HPA	03.15.2017	
☐	last name, first name	sent to HPA	03.10.2017	

Change Status

Case Notes Database Mockups *continued*

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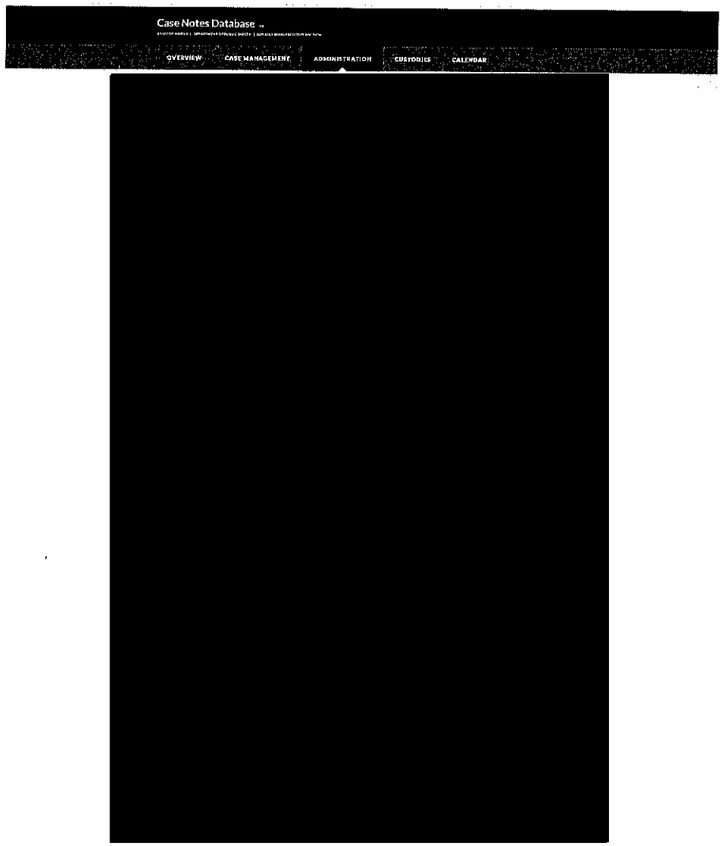
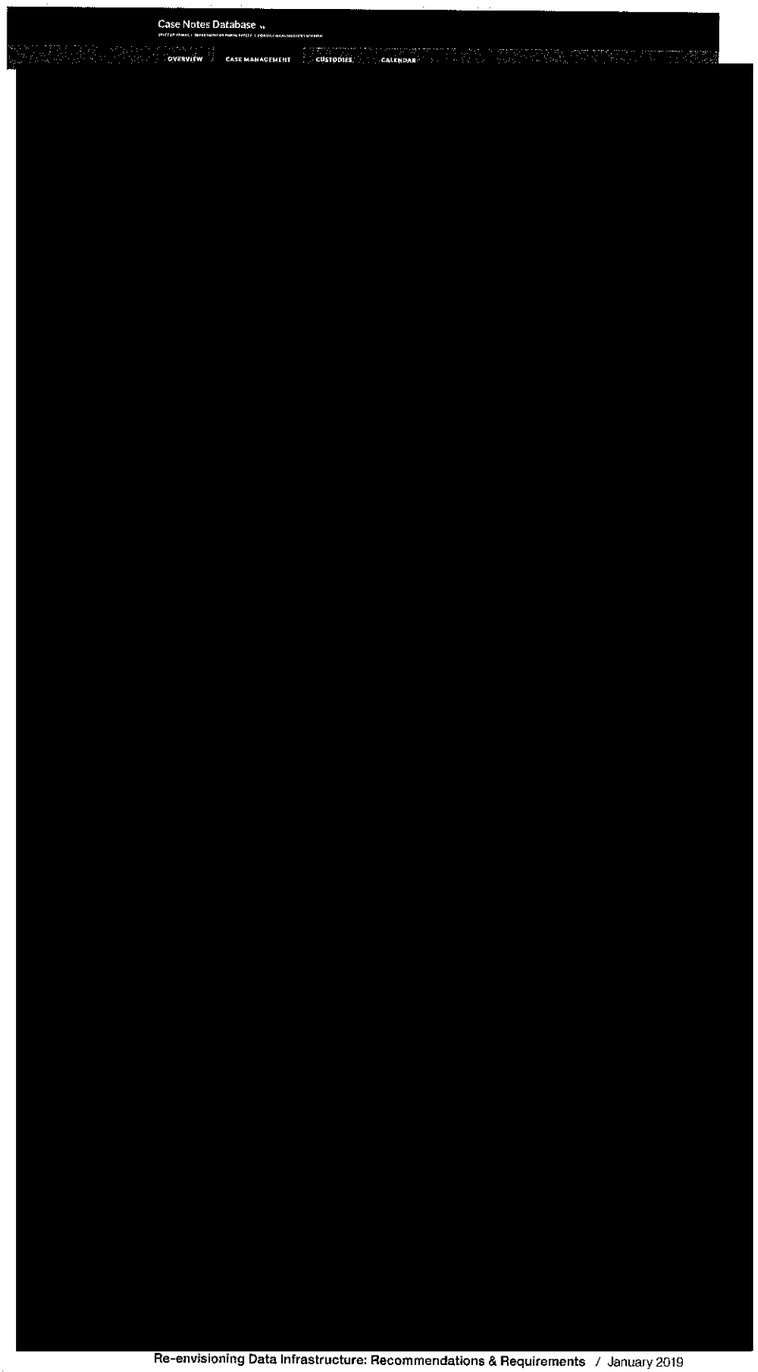
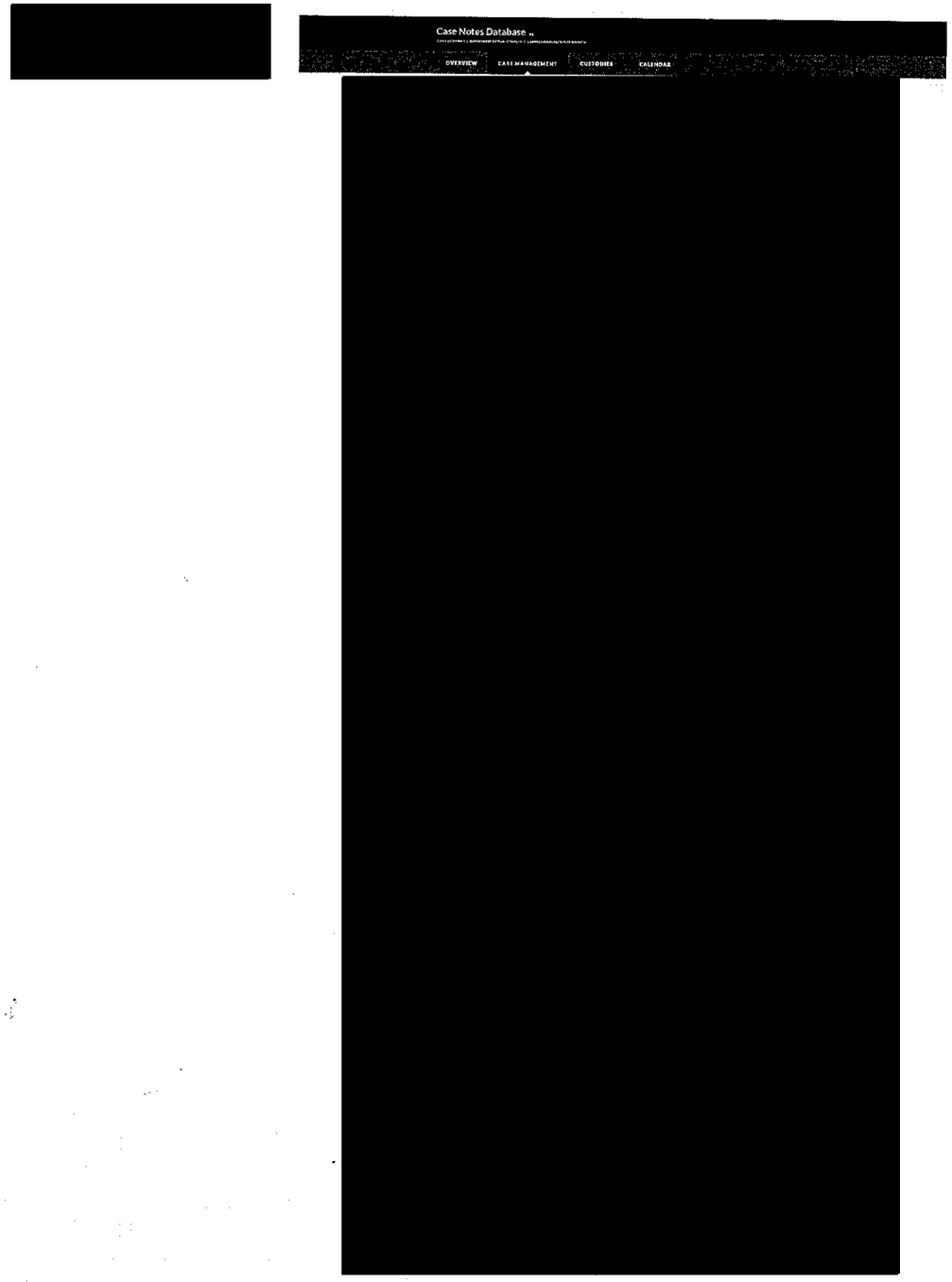
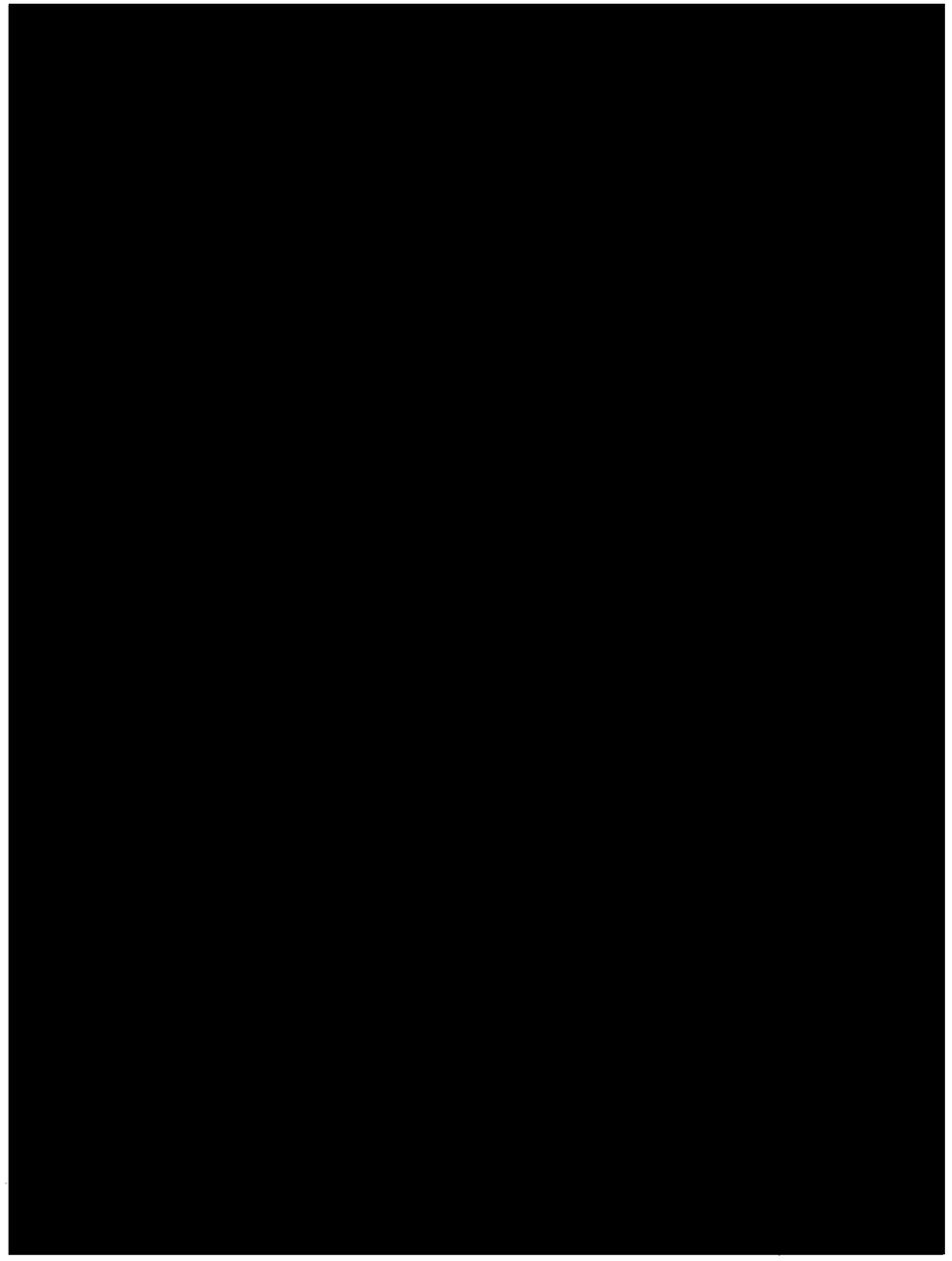




Case Notes Database Mockups *continued*





Appendix: Reference Pages

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