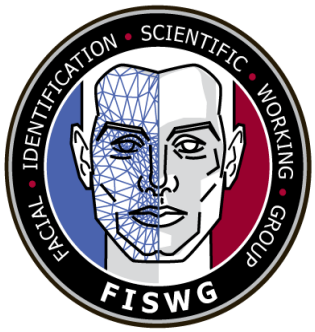

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Section 4.1 Use Case: Department Motor Vehicle

Guidelines for Specifications, Procurement, Deployment, and Operations

Facial Recognition System Guidelines Scope

This document provides a general outline of issues to consider when commissioning a Facial Recognition Searching System (FR). It is structured into five high level sections, each representing a phase in a logical process flow:

- Business Case Definition,
- Requirements Gathering,
- Proposal and Procurement,
- Deployment Planning,
- Operations and Maintenance.

Each section provides an overview of relevant topics and main questions to be asked at that particular phase in the commissioning process. As the purpose of this document is to give a general idea of the process, a more detailed treatment of the topics in each section will be provided in subsequent FISWG documents. The work herein reflects the best practices gathered and lessons learned by FISWG.

The document is not intended to be an in-depth study of facial searching systems, a review of facial algorithms, a buyer's guide to FR systems, nor a standard on the design and deployment of FR systems.

The intended audience of the document is:

- Agencies that have not deployed but may be considering a FR system.
- Agencies that will be deploying a FR system.
- New users of a FR system.
- Any agency or user who wishes to gain a broader understanding of FR system concepts.

An *Agency* will refer to the organization responsible for the FR system. A *user* will utilize or support the FR system.

This document will address a specific use case of a Facial Recognition Searching System: augmenting a Department of Motor Vehicles (DMV) solution. The FISWG Section 4 Guideline document will be used as a baseline and will address questions posed by the Guideline document for this specific use case. Some of the assumptions in this document will not be applicable to all DMV solutions, but the intent is to address the Guidance in Section 4 with answers that can help new or current users.

All use case examples will be formatted in this style throughout the document. All use case details in this document are hypothetical.

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Business Case Definition

Goal

The goal of this phase is to ensure the Agency is capable of discussing the operational scenarios of the FR system and understanding the Business Case for the FR system. This knowledge will be the basis for the following phases because it forms the justification for the entire system. It will also allow the Agency to selectively discuss with users, subject matter experts, and potential vendors system specifics that will be important in getting accurate information going forward.

The first step in commissioning a FR system is defining the Business Case that states what the FR system is intended to do for the Agency. Key questions in this phase are:

- Who are the primary stakeholders?
- What is the ultimate goal of the FR system?
- How will a return on investment (ROI) be measured and defended?
- What are the questions that should be asked when building a Business Case?
- How will the FR system integrate into new or existing operational processes?

Intended Audience

The intended audience of the FISWG documents on FR Business Case definition is the entire group or team responsible for the overall system as defined by the Agency. The documents should be available to all people involved in the FR system so that the original basis for the system can be identified. The information given in or derived from the Business Case documents could be considered internal to the host agency and may not be considered appropriate to share outside the agency.

Outcomes

When this phase is complete, the end result is an easy to understand description of what the FR system is to achieve.

This is an example.

The primary stakeholders of this DMV system are:

- **DMV Agency. This stakeholder represents the end users of the FR DMV system. It is assumed the Agency will be responsible for all aspects of the DMV system including locations, all IT infrastructure issues, and all physical assets.**
- **DMV staff. This stakeholder represents the users who must participate in the creation and issuance of the DMV card.**
- **State: This stakeholder represents several agencies within the State.**
  - **Policy**
  - **Legal**
  - **Budgetary**
- **DMV customer. This stakeholder represents the target audience whose identity is represented by the product of this Agency: a State issued license (that serves as an identification card.)**

The core problem being addressed is to utilize FR to ensure that a person being issued a DMV license is a singular identity. A facial image will be captured during the issuance of a driver's license and will then be used to search the entire DMV facial gallery to see if the facial image finds any other identities of the person. (This is currently done with a standard textual query of name and date-of-birth.) FR will be used because a facial image is currently captured, has a legacy gallery of facial data, is accepted by the target audience, and is supported by the laws of the State.

Other biometrics (e.g., finger or iris) will not to be used at this time due to legal oversight and cost issues. It is unknown if future laws will allow other biometrics to be captured with facial images.

The ROI on adding FR to the DMV system will be measured in ways that include:

- **How many instances of DMV fraud can be detected or prevented? This metric will be non fiscal and will address personal identification fraud.**
- **How much money can be directly saved or recouped by detecting and addressing fraud? This metric will be fiscal and must be proven with actual monetary examples.**
- **How will the DMV customers react to FR being used with DMV issuance? This metric will be non fiscal and will address acceptance of FR for DMV issuance.**

The following statements pertain to the need of adding FR to the DMV issuance process:

- **DMV fraud is assumed to be present in a small but highly relevant population within the State. Other Agencies have presented and defended various rates, but the occurrence in this State is not accurately known.**
- **The cost to implement DMV is estimated to be under $1 per license. This is a very defendable cost when it is compared to the cost and drain on State citizens who have suffered identity fraud through DMV channels.**
- **Adding FR places the Agency in alignment with other advances and programs being used with other States or Federal agencies.**

The basic operational flows present in the current DMV issuance process will not change. A DMV customer will come to the DMV locations, fill out the proper forms, take the proper tests, and have a frontal picture taken. Once all the required information is present in the DMV system, and before the actual DMV card is created and issued, a search will be done with the new frontal image against the entire DMV facial gallery to see if the person in this photo is registered to any other DMV identities. If the person in the photo compares favorably to a singular identity, then the DMV issuance can proceed as intended. If the person in the photo compares favorably to a multiple identities, then the DMV issuance will be modified to resolve the multiple identities. In cases where fraud is detected, then the proper authorities to properly manage this within the laws of the State will be followed.

The frontal photo taken and the operational processes to capture this photo will ensure the FR search has the best quality facial image to work with. Each DMV location will need a site survey to ensure the physical location is sufficient to host the imaging equipment. Proper training will be addressed to ensure the Agency users have the necessary skills in acquiring this photo and how to ensure the photo is acceptable.

Requirements Gathering

Goal

The goal of this phase is to turn the Business Case into requirements that can be understood by vendors and ensure the purchased FR system is fit for purpose. This knowledge forms the bridge between the Business Case and the Proposal and Procurement process that follows.

In the Requirements Gathering phase, an initial set of requirements of the intended FR system is created based on the information presented in the Business Case. Key points in this phase are:

- What specific information needs to be known to properly translate the Business Case into a technical system specification that can be reliably and confidently presented in an official proposal for bidders?
- What are the constraints?
- What specific questions regarding FR systems need to be asked?
- What Information Technology (IT) based questions need to be asked?
- What is lacking in the Business Case that may need to be revisited or clarified?
- Which requirements are fundamental and which are good to have but not vital? In other words, delineate the ***must haves*** from the ***nice to haves***.

Intended Audience

The intended audience of this phase is the technically and operationally oriented members of the group or team responsible for the overall system as defined by the Agency.

Outcomes

When this phase in the commissioning process is complete:

- The description of the Business Case should be traceable into the system requirements,
- There should be enough detailed information to prepare a system proposal,
- System costs areas should be defined or at least identified,
- Service level agreements that must be clearly defined in the proposal should be identified,
- The users of the system should be able to understand how the described system will affect their operations at a high level,
- There should be agreement across the Agency that the information defined is appropriate and accurate.

This is an example.

The following information is known about the State DMV system:

- **The DMV Agency currently has 300 issuance locations. There are no new locations planned nor are there any plans to change locations of any existing locations.**
- **The location of the DMV IT system is at the State Capitol in building X Room 100. The FR repository must be located here.**
- **The current State population is 7 million people.**
- **The current DMV repository holds 35 million images dating back 10 years.**
- **There are facial images from three different photo imaging systems in this repository.**
- **The State issues DMV licenses every four years. So approximately 1.75 million DMV licenses are issued yearly.**
- **The growth rate for DMV issuance is 3% per year.**
- **There are 100,000 DMV deletions per year due to registered deaths.**
- **The facial photo captured for all DMV issuances must be retained indefinitely unless deleted from an authorized and approved process.**
- **Any deletion must be archived in an offline repository.**
- **This FR system must function for four years.**

The following constraints are known:

- **An authorized DMV license must be delivered within two weeks of the DMV visit.**
- **The DMV Agency operates 8 AM to 5 PM, five days per week, and observes State or Federal holidays.**
- **DMV users must be trained every year and complete a system competency test.**

- **DMV users must not be able to download any DMV information to any removable media.**
- **The act of capturing a facial image should not exceed 1 minute.**

The following issues relate specifically to the FR systems being added to the DMV system:

- **The Agency uses a blue background for the facial images in the licenses.**
- **The DMV license uses a electronic chip that requires an image of no larger than 10 Kbytes for storage.**
- **The DMV systems cannot store a facial image that is larger than 100 Kbytes in size.**
- **The Agency has a maximum image capture area of 4' by 6'.**
- **The Agency cannot allow any more than two point lighting to be added for facial capture.**
- **The facial capture hardware used by the Agency should be fully documented (refer to the FISWG capture document).**

The following information is known in regards to Information Technology (IT) issues:

- **The hardware, operating systems, software, databases, and networking gear used by the Agency should be fully documented.**
- **The State requires the following Information Assurance (IA) policies and mandates. This includes Personal Identifiable Information. This should be fully documented by the Agency.**

Proposal and Procurement

Goal

The goal of this phase is to prepare a formal solicitation (e.g., Request For Information (RFI), Request For Proposal (RFP)) based on the Business Case and findings of the requirements gathering phase. The solicitation forms the basis for a systematic evaluation of the proposed FR solutions.

Key points in this phase are:

- What requirements does a potential bidder have to cover or meet?
- What timelines are present for the FR system deployment?
- Determining if responses meet requirements.
- Assessing the performance of each system and selecting a system for procurement.
- What long term technical and business issues should be covered?
- How to protect the business value of the system and ensure vendors are held accountable?
- Planning for revision and clarification of the Business Case and Requirements.

Intended Audience

The intended audience of this phase is the business oriented portion of the group or team responsible for the overall system as defined by the Agency.

Outcomes

When this phase is complete:

- There should be an RFI or RFP that vendors can review. This should mandate a defendable cost of goods for the entire FR system for the length of the contract period.
- There should be broad consensus across the Agency that the information in the RFI or

RFP is appropriate and properly protects the interests of the Agency.

- The approach by which the FR system will be selected and measured by the Agency.

This is an example.

Any potential bidder must meet the following requirements:

- **Must have deployed at least three other similar FR systems in a 1:N configuration with a minimum gallery size of 5M enrollments and have references from these systems. A site visit by the Agency to these systems will be done.**
- **Must have demonstrated interoperability with at least three other data systems. The protocols and data structures used for this must be detailed.**
- **The system must meet a 99% uptime requirement and be part of the reference sites submitted.**
- **Must use FR technology that has been tested by NIST.**
- **Must post a performance bond as per Agency defined policy.**
- **Must offer a fully staffed English speaking support department that is available 8 AM to 5 PM five days per week.**
- **On call support staff must respond within four hours of a trouble ticket call placed to the support department.**
- **Must offer a system warranty and software updates or patches as needed.**
- **Their solution must be compatible with all Agency IT guidelines or mandates.**
- **Must offer a complete and sustained training program.**
- **Have development and support staff certified to develop or maintain equipment in use by the Agency IT guidelines or mandates.**

The following timelines and milestones are known:

- **The first DMV system must be operating within 90 days of award.**
- **The DMV system must be fully deployed within 180 days of award.**
- **The DMV Agency training courses must be delivered for Agency review within 60 days of award.**

The following long term technical and business issues will need to be addressed:

- **If a new facial image is found to not match an existing facial image in the DMV system with the same identity, or matches to an incorrect identity, the vendor must state why and if any possible corrections can be done to assure it does not repeat.**
- **Any operational issues that can be addressed to make the complete DMV process and solution more accurate, reliable, efficient, or affordable.**

The following FR performance criteria and metrics must be delivered to the Agency on a monthly basis on a per month and total basis:

- **System uptime and downtime.**
- **Response time on service calls.**
- **Searches done.**
- **Average enrollment time.**
- **Average search time.**
- **Number of new enrollments.**
- **Facial gallery size.**
- **Number of failure to enroll images.**
- **Number of FR matches per previous enrollments.**
- **Overall quality of the facial images as it pertains to the FR matching done with this DMV solution.**
- **Trends on system growth and operational metrics sufficient to predict any**

potential operational issues.
- **Status of system data backups ensuring data preservation and restoration are available if needed.**

Deployment Planning

Goal

The goal of this phase is to successfully deploy a system that meets all the criteria laid out in the preceding phases, done in a manner that minimizes risk.

In the Deployment Planning phase, the Agency creates a deployment plan of an operational FR system. Key points in this phase are:

- Should a limited deployment be done before large scale deployments?
- How should the deployment be staged? Are there fundamental key issues that need to be resolved before more work is done?
- How will training be done?
- How will the initial system be confirmed as meeting the business and design goals?

Intended Audience

The intended audience of this phase is the technical deployment teams, installers, system administrators, and users of the system.

Outcomes

When this phase is complete:

- The deployment approach is understood and accepted across the Agency.
- The Agency should have a clear idea of how the deployment will progress along a timeline with known dependencies.
- User training integration and techniques are defined and a user group established.
- Other dependent agencies are notified and awaiting early results.
- Early "wins" are identified and "lessons learned" recorded.
- Acceptance test plans are defined and traceable to the RFP.

This is an example.

The Agency wishes to deploy the FR system in a multi-step manner:
Step 1:

- **The internal FR infrastructure will be built within the IT hosting facility.**
- **A complete data migration will be done importing the current facial images. Any necessary data cleansing or reconciliation must be done at this stage.**
- **A vendor analysis will be done of the complete facial gallery and will be presented to the Agency which details the facial images and provides a subjective evaluation of their quality for FR searching. Included in this will be any recommendations that could be done to mitigate any perceived risk in the data.**
- **A single installation test site will be built within the State Capitol that reproduces the environment at a DMV Agency.**
- **Four experienced individuals from the DMV issuance station closest to the State Capitol will be selected for training. This group will represent the beta users group for the State wide system.**
- **This group will then be responsible for taking the training, using the system, and judging the overall completeness of the entire solution.**
- **At this point it will be the responsibility of the DMV Agency to ensure that all**

relevant test cases needed for the day-to-day operation of the system are clearly articulated so proper testing can be verified.
- **Feedback across the complete system will occur before the real deployment starts.**

Step 2:
- **A single installation site closest to the State Capitol will be selected.**
- **The staff at this site will be trained.**
- **The site will be modified for the new FR implementation.**
- **This site will run for two weeks before a State wide deployment decision occurs.**

Step 3:
- **The system is installed across the State in a way that is decided by logistics, infrastructure, or any other issues deemed important by the Agency.**

The scenario described above includes a limited deployment before a large scale deployment is done across the State. Its main focus is operational in nature and not specifically targeted at maximal accuracy or targeted fraud scenarios. This is being done to ensure the FR additions to the State DMV systems are operationally feasible to the DMV Agency, the staff, and the effective operations given to the citizens of the State. In other words, the smooth and continued operations of DMV issuance is the primary concern here. The Agency may choose to do several smaller and specific operational scenarios after the FR integrated DMV system is deployed.

The largest logistical concerns over the FR deployment will be targeted at the DMV Agency themselves and the communication lines to the FR IT centers. The deployment plans must have proper and complete site surveys done to ensure proper FR capture areas and a verified network capacity checked before FR is turned on at each DMV site.

Training for the proper operation of the FR portions of the DMV system users must be done in accordance with acceptable Agency guidance and guidelines. After this is met, the goals will be as follows:
- **Computer based training material is to be provided with accompanying paper materials.**
- **A simulation site (either physical or virtual) must be provided with the training.**
- **A verification test must be provided to ensure DMV Agency employees can pass a basic acceptance test.**
- **The verification test must be done yearly or as needed for system modifications or updates.**

Operations and Maintenance

Goal

The goal of this phase is to have the Agency successfully manage an FR system extracting the maximal business value that is expected or achievable.

In the Operations and Maintenance phase, the Agency prepares to monitor the FR system throughout its expected life-span. Key points in this phase are:
- What types of proof need to be extracted to defend the original ROI?
- What needs to be done to ensure the system performance is maintained and optimized?
- How is the system transitioned or upgraded?

- How do you ensure responsiveness from vendors on system support while avoiding dependencies?
- How is user group feedback incorporated into system evolution?

Intended Audience

The intended audience in this phase is the business analysts, system administrators, and users of the system.

Outcomes

Because this phase will continue for the life of the project, the following outcomes should be well known and actionable:

- The intended audience should have a strategy for how FR system performance will be evaluated.
- The agency should have clear engagement rules with the vendors on how to get adequate system support.
- Processes are in place verifying critical data is retained and protected.
- A review of this document should solidify the linkages across the complete commissioning process from Business Case to Operations and Maintenance.

This is an example.

The fundamental basis for the FR additions to the DMV system is based on ensuring a State Driver's License (or possibly other identification card) is issued to a single person with a single identity. To this stated goal, the Agency will need to know the total number of licenses issued as well as how many licenses were not issued due to the FR modifications done to the operational issuance process. In decreasing order of importance, this can be extended to other areas all of which must be presented in a dollars spent versus benefit gained:

- **Licenses not issued due to fraud detection from FR.**
- **Any direct money saved or fraud prevented from these cases.**
- **Any criminal cases assisted through the use of these cases (as allowed by State law). This information may not be available for public release due to the case specifics.**
- **Any decrease in operational service from using FR for DMV issuance.**
- **Incremental cost per license from the FR system.**

Operational and technical areas on the FR system itself should be kept separate from the business related issues recorded and presented above. This list includes the following areas:

- **Are the users of the system performing up the expectations of the Agency? Are there any training areas that should be improved?**
- **Growth of the computing infrastructure dedicated to FR. Is the growth seen in-line with the predictions and assumptions made?**
- **What areas have been noted within the issuance process that can be improved making the system better and easier for the DMV Agency?**
- **Is the data within the FR system being backed up properly? Have there been any Information Assurance or security issues that need to be resolved?**
- **Have the vendors given proper service keeping the FR system running at desired levels of performance and reliability?**
- **Has the vendor conducted periodic system validation tests ensuring the biometric integrity of the entire FR solution?**

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