



**SOCIETY OF AMERICAN
GASTROINTESTINAL AND ENDOSCOPIC
SURGEONS (SAGES)**

REQUEST FOR PROPOSAL

VIDEO BASED ASSESSMENT (VBA)

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LOS ANGELES, CA 90064

MAY 2023

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SECTION I. INTRODUCTION

The Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) is initiating a Request for Proposal (RFP) from qualified software development firms for a Video Based Assessment (VBA) system.

This Request for Proposal requires firms to outline their interest and capabilities in providing a system to host the VBA, along with pricing projections specific to each requirement and timelines for delivering the overall product. Interested firms may submit a proposal for some or all the services described within this RFP. SAGES reserves the right to withdraw the RFP from the bidding process at any time.

I.I. ABOUT SAGES

SAGES is a not-for-profit professional membership organization which represents a worldwide community of surgeons that bring minimal access surgery, endoscopy and emerging techniques to patients in every country. Representing over 7,000 surgeons and allied health professionals, SAGES' mission is to provide leadership in surgery, particularly gastrointestinal and endoscopic surgery, in order to optimize patient care through education, research, and innovation.

The educational programs SAGES develops teach and assess the knowledge needed for a wide range of experience levels including: nurses, surgical residents, fellows, and practicing physicians. SAGES' educational portfolio offers learning opportunities to physicians in the United States, Europe, and parts of the Middle East and Asia. Combined, they serve approximately 5,000 new users a year and 2,500 returning users. Programs are administered by 20 staff members and more than 100 Subject Matter Experts (SME).

I.II. BACKGROUND

Performing operations is what differentiates surgeons from other physicians – and to a large degree, what happens in the operating room dictates patient outcomes. Traditionally, the process of credentialing and certifying surgeons for independent practice requires passing both a written and oral exam, where candidates are evaluated on their knowledge and judgment of surgical care. Throughout training, surgeons are also required to meet program-specific technical competencies. Operative skills are a key measure of surgical practice that correlate with patient outcomes, yet no formal assessment of these skills exists at the completion of training or after learning a new procedure in practice.

There is an emerging body of evidence confirming a strong association between intraoperative and technical performance assessed by video analysis and patient complications. Changes in surgical education and maintenance of certification to focus on competency assessment creates an opportunity for SAGES to lead the field and leverage its background and experience with innovation and educational measurement. SAGES aims to leverage VBA to set benchmarks to confirm surgeon competence prior to independent practice and to provide focused coaching to improve individual performance.

I.III. PURPOSE

SAGES is requesting proposals for a web-based VBA system that facilitates the process of submitting videos for assessment, reviewing and rating submissions, tracking and sending assessment results and feedback, and partner system integration and reporting. The system will be a canned, off-the-shelf system that requires little to no customization to meet SAGES needs. SAGES will not accept proposals for the development of a system built from scratch.

This RFP does not constitute an offer of contract, nor will SAGES be liable for any costs incurred by respondents in preparation and submission of information in response to this RFP. SAGES reserves the right to cancel this RFP at any time, reject all or part of a proposal or to award multiple development firms.

I.IV. RFP SCHEDULE

All interested proposers must email a letter of intent to vanessap@sages.org stating their interest and intention to bid by: **June 1, 2023**. Proposers who submit a letter of intent will be invited to a group Q&A session. Questions regarding the RFP may be submitted by email to vanessap@sages.org.

Activity	Due Date
Request for Proposals available	May 1, 2023
Email to SAGES stating your interest (letter of intent)	June 1, 2023
Q&A Session (group review of RFP)	June 2023 (actual date TBD)
Proposals Due to SAGES	July 1, 2023
Preliminary Evaluation	July 3, 2023
Proposer Demonstration/Interviews	August - September 2023
Contract Negotiations	September - October 2023
Award of Contract	October 2023

I.V. CRITERIA FOR SELECTING A VENDOR

The winning vendor will be selected primarily on their qualifications, approach, and strong grasp of the project needs based on this RFP. Associated costs must also be proportionate to the proposed solution. SAGES will evaluate proposals based on the following criteria:

- Solution meets requirements of the RFP,
- Solution ensures a streamlined user experience, data integrity and accessibility,
- Solution is cost effective and sustainable for a minimum of 15 years,
- Firm has relevant product experience and qualifications,

- Firm is adaptable and flexible in providing some customization as needed,
- Firm's customer service and Service Level Agreement.

I.VI. SUBMITTAL REQUIREMENTS

Proposals must be submitted online at: www.sages.org/rfp-vba/submit-proposal/ and include the following:

- A concise explanation of the services you will provide/activities you will perform to meet the requirements of this RFP.
- Description and qualifications of project team,
- Estimated project timeline,
- Total estimated project cost,
- Samples of past work,
- Identification of any needs that cannot be satisfied by the vendor.

SECTION II. SCOPE OF SERVICE

The scope of services set forth in this Request For Proposals represents an outline of the services which SAGES anticipates the successful proposer to perform, and is presented for the primary purpose of allowing SAGES to compare proposals. The precise scope of services to be incorporated into the agreement shall be negotiated between SAGES and the successful proposer. Proposers are encouraged to suggest any changes to the scope (as a part of the proposal) in order to better achieve SAGES' stated project objectives and deliverables.

II.I. OBJECTIVES

The objective of the VBA project is to implement a central system that will allow surgeons and surgeons-in-training from around the world to upload and store surgical videos of operations and enable them to grant access to other surgeons to view and make commentary on those videos. The VBA System will be capable of handling the current SAGES programs and will be highly extensible to allow for the onboarding of future programs and requirements as they arise. The system will:

- Reduce the amount of time it takes learners, staff and SMEs to become familiar with the system by reusing workflows where appropriate and create intuitive user interfaces.
- Improve the integrity of data and reduce redundancy by implementing error checking and normalizing common fields.
- Increase access to data through APIs and a report builder.
- Be designed for easy storing of videos of surgical procedures.
- Be designed for easy sharing and access of videos of surgical procedures with other users of the System.

- Be designed for seamless annotation of stored surgical videos.
- Reside in a cloud or cloud-like environment, accessible remotely to specific members who are granted access with a secure login.
- Site should support multi-factor authentication and enforce password reset policies.
- Be accessible from various groups based on geographic location.
- Allow access to a user portal for admin authenticated and created user accounts.
- Have account management and admin level settings, the ability to differentiate accounts based on permission levels and associated user access with a rich interface to manage user entitlement settings.
- Site should record user activity for audit tracking. Track login activity, access to data and changes to data.
- Application should support the exporting of a user attestation report to identify users who have access to the site, last login date and entitlements.
- Health check monitoring of the application state/services should be enabled, along with the availability of system logs which do not contain PII (personal identifiable information)
- Follow security guidelines for protected health information (PHI) and privacy as laid out by member institutions, as well as local, regional, and national laws throughout North America (e.g., Health Insurance Portability and Accountability Act (USA))
- The first iteration of the System will be largely designed for the storage and annotation of surgical data that include videos and images that are stored on the system.
- Imported data should have unique identifiers that can be linked to databases that are either housed internally within the same virtual environment, or externally.

II.II. DELIVERABLES

The following list of deliverables is intended to serve as a structure for proposer responses, including costs and timeline. Proposers are free to make additions that they believe will further assist SAGES in reaching its objectives. The proposer will be expected to deliver:

1. **Requirements** – discovery elicitation process that results in well defined, validated use-cases, functional and non-functional system requirements.
2. **Prototype or Mockups** – an interactive visual representation of the user interface and workflows.
3. **Implementation Plan** - a description of how the solution will be deployed, integrated with other systems, and managed once live.
4. **VBA System** – the product of building the approved requirements and prototypes/mockups.
 1. **Performance Assessment:** evaluation of a surgeon or surgical trainee’s performance to determine whether they meet standards as validated by SAGES Rubrics
 2. **Coaching:** focused feedback provided to surgeons and surgical trainees on their performance to highlight education areas/skills for practice and teaching sessions.

3. **Performance Review and Surgical Debriefing:** data and analytics on safety issues that happened during an operation along with feedback on actions and behaviors on areas that could be improved.
4. **Data Repository:** access to both raw and annotated surgical datasets.
5. **Machine Learning:** ability to link to an internal or external ML workflow for training and/or testing algorithms and running algorithms on stored dataset.
5. **User Documentation** – complete wiki/documentation of the system and how to use it as a learner, SME, and administrator.
6. **Training** – the process of teaching SAGES staff to use the VBA system.

II.III. PROJECT TIMELINE

SAGES anticipates that this project will take between 9 months and one year to fully complete. Proposers are encouraged to align with this timeframe and explain any activities that may push the project out past it. SAGES expects features to be rolled out as they are completed and declared usable and functional. The actual timeline will be agreed upon at contract signing.

PHASE I: Implementation and Pilot		
November 2023 – January 2024		
<ul style="list-style-type: none"> • November: Discovery, development, and implementation • November - January: Pilot, user acceptance testing, feedback, and system refinement • January: Presentation to SAGES Board 		
Requirement	Priority	Comment
Web-based	Must Have	Accessible globally
Login and Authentication		2-factor authentication
Role Based Permissions	Must Have	
Global Decentralized Storage	Must Have	Minimum of 200 TB, expandable
Compliance with Data Laws and Regulations	Must Have	US, Canada, EU
Accessible in N. America	Must Have	
Accessible in Europe	Nice to Have	
SAGES Branding	Must Have	
User Interface/Experience	Must Have	Basic customization to allow for requirements and white label
Data and user activity tracking	Must Have	
Multimedia Upload	Must Have	Via external storage (USB, external drive, laptop, etc.)
Video Player	Must Have	Basic feature (fast forward, pause, 2x speed, etc.)

Data Search, Retrieval, Sort, Filter	Must Have	
Annotation: create and deploy custom ontologies	Must Have	E.g. SAGES VBA rubrics
Annotation: Global Video	Must Have	Classifications
Annotation: Temporal	Must Have	Includes phase annotations and time points, and the ability to jump to various segments of the video
Data Filter: Technical	Must Have	Technical standardization prior to data storage
Data Filter: Qualitative	Nice to Have	Quality assurance filter prior to data storage
Private Workspace	Must Have	Data is only available to user who uploads it
Video Editing	Nice to Have	Video editing functions on stored multimedia (trim, merge multiple files, etc.)
Mobile App	Nice to Have	

PHASE II: Customization and Go-Live

January 2024 – May 2024

- **January - March:** Custom development, user acceptance testing, feedback and refinement
- **April:** Board review and go-live prep
- **May:** Go-Live

Requirement	Priority	Comment
Annotation Export	Must Have	
Track and Log User Activity	Must Have	
Partner System Integration	Must Have	API
Annotation: Spatial	Nice to Have	Semantic segmentation
Annotation: Coaching	Nice to Have	Live and non-live simultaneous viewing and annotating of videos with other invited users.
Additional Anonymization	Nice to Have	Additional blurring of video when view is outside of body.
Multimedia Upload: advanced	Nice to Have	Upload behind cloud from institutional firewall
User Interface and Experience: advanced	Nice to Have	Dependent on current system capabilities
Link to other databases	Must Have	Link individual video file to specific patient profile in internal or external databases, or electronic health record

SECTION III. THE VBA SYSTEM

The Video Based Assessment (VBA) system will be used to upload, store, analyze, score and give feedback on videos. It will deliver 3 upcoming SAGES VBAs (i.e. 3 different procedures) and an unlimited number of future VBAs.

The system will allow multiple user types to upload procedural (i.e. unedited intraoperative) videos as well as review and score those videos, using a built-in assessment form. The system and its content may be available to both SAGES members and non-members or restricted to members only. System content includes, but is not limited to: demographics, videos, images, annotations, rubrics, scores, score reports, feedback from Subject Matter Experts (SME) and peers.

Access to the system and content will require learners to create an account/login and pay any associated fee. Fees to access the content may differ for members and non-members or be the same. eCommerce and account creation and login may be managed by a SAGES partner system.

All uploaded videos will be deidentified before they are saved to the system and then be associated with user provided demographics and system generated annotations. Videos will be stored in permission-based repositories. By default, every user will have a personal repository that only includes the content they upload to the system. From this repository the user can review, edit, annotate, and share their content with other users as well as revoke access to shared content. Purposes for sharing content may include but are not limited to: VBA assessment, feedback from SMEs, feedback from peers, coaching, and research/innovation purposes.

There will also be group repositories/shares and a public repository. An unlimited number of group repositories can exist and may be used by residency programs for peer purposes, SMEs to assess videos, or provide feedback. Videos included in the public and group repositories cannot be edited, deleted or reshared, unless permission is granted. In addition, permissions may differ by group.

III.I. SYSTEM REQUIREMENTS

The system is comprised of four areas: user interface and experience, data storage and management, annotation of surgical dataset, and system security. What follows is a description of these areas, and the technical constraints the system must adhere to.

USER INTERFACE AND EXPERIENCE

- Web-based
- Must current, and past two version of: OSX, Windows, Chrome, Edge, Firefox and
- After Login, users will access a Home Dashboard with menu options that provide access to:
 - Personal storage/repository.
 - Shared storage (where permissions have been granted).
 - User profile and preferences (e.g. user data, discoverability settings).
 - Requests for data sharing (if data sharing has been selected).

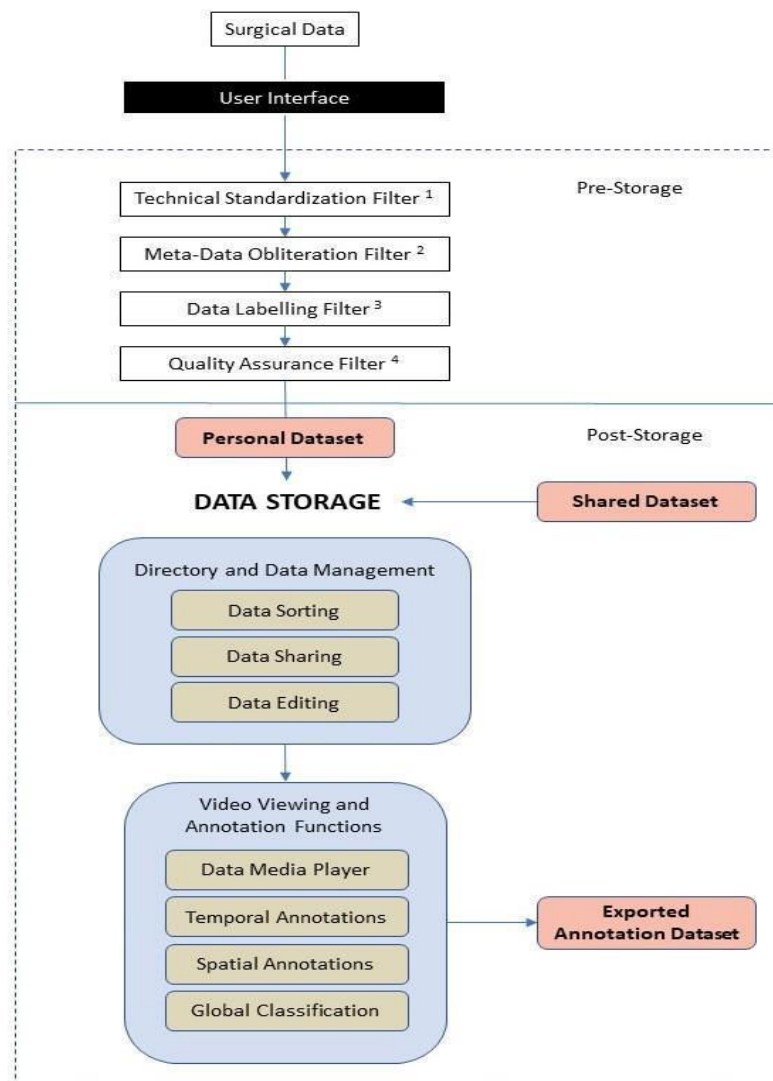
- Parameters for data sharing requests that will be entertained. e.g., specific surgeon, research project type, etc.
- Personal Repository:
 - Once in the personal storage feature, there will be a directory of all uploaded data.
 - Users have the option to create new folders and subfolders within this directory.
 - Users will have the option to upload new video from a local workstation with the option to merge multiple files or trim uploaded videos.
 - Users can “tag” videos with labels, including “favorites” and “flag” options for easy retrieval and sorting.
 - Users can fill out meta-data, demographics or other clinical information for a given video for pre specified fields (e.g. age, gender, body-mass index, procedure, diagnosis)
 - Users can assign sharing and annotation options for each video in the directory.
 - Users can select any video for viewing in an integrated video player with embedded annotation tools.
 - Video player should have standard capabilities for pause/play/toggle/fast-forward x1.5 to x4.
 - Annotations for each video can be visualized globally as bookmarks (including annotations made by others who have shared access, with the option to include or exclude), with further option to show details of selected annotations.
 - Annotations can be deleted by the same user only.
 - Annotations can be downloaded.
- Shared Repositories:
 - Once in the shared storage feature, there will be a directory of all shared data.
 - Users can select any video for viewing in an integrated video player with embedded annotation tools (as long as annotation permission has been granted).
 - Annotations for each video can be visualized globally as bookmarks (including annotations made by others who have shared access, with the option to include or exclude), with further option to show details of selected annotations.

DATA STORAGE AND MANAGEMENT

Prior to entering data storage, the data will undergo pre-storage filters:

1. Standardizing technical requirements. Prior to storage, all data will undergo a processing phase to make sure all data fit the same format. (e.g., videos and images need to be standardized to specific frames per second, resolution, aspect ratio, file format).
2. Obliteration of file meta-data. To protect patient privacy and confidentiality, all efforts should be made to erase meta-data associated with surgical videos and images. Additional filters will be applied for anonymized video (e.g., blurring the video when the camera is taken out of the surgical field). Code to perform these functions can be found at: https://github.com/tmward/tmw-misc/blob/master/video/deidentify_videos.py.
3. Each multimedia data will have to be labeled with one or more labels. Labels can include:

- Diagnosis associated with the video/image (drop down menu of possible diagnoses using standardized list, such as ICD-10 codes)
 - Procedure associated with the (drop down menu of possible surgical procedures using standardized list, such as CPT codes)
 - Unique identifier number associated with each multimedia file. This unique identifier number will be generated by the system to include: a code for the user who uploaded the data and a randomly generated code unique to the case file. E.g., “56-TiVi78?i*&e”, where the data was uploaded by user “56”, for video “TiVi78?i*&e”.
 - There is the option to link a given multimedia file to an external clinical database or electronic health record.
4. Prior to data being amalgamated into main storage, it will undergo a quality-assurance step. The data will be kept in the pre-storage space and an administrator will evaluate to make sure the data fits all the criteria to be included in the main storage. Approval by the administrator is required prior to including the uploaded surgical data into the main storage.
 5. Data will be stored in the virtual environment according to a directory based on the labeling. Users can search and retrieve multimedia files hosted within their private workspace or shared workspaces or groups using filters for specific diagnosis, surgical procedure and labels. Within the storage space, users can view the multimedia using embedded video player software.



Allow data owners:

- House various file types including AVI, MP4, MPEG, MOV, WMV, JPEG, PNG, GIFF, TIFF. These file types must be viewable to authenticated members and be stored in a sortable manner. It should have the capability to remix video files to a standardized container.
- Provide scalable storage with capacity for minimum 200 TB worth of data.
- Files will be indexed in a directory according to accepted ontology and will be labeled using “tags” for storage and user-friendly retrievability.
- Sort and organization functions for files, including creation of folders and subfolders.
- Allow users uploading data and admin to grant/remove access to other users to their private workspaces.
- Files can be “flagged” or selected as “favorites” with a Favorites folder.
- Surgical procedures that are segmented into multiple video files can be merged into a single video file, with the capability to create new videos.
- Videos can be trimmed and edited by the user.

ANNOTATION OF SURGICAL DATASET

- Plugin to propriety annotation tools while completely contained within the cloud infrastructure (i.e., housed in the same virtual environment)
- Flexibility to add/modify/save/delete annotation ontologies for users with permission level only.
- Annotations can include items such as:
 - Classifications (e.g., Yes/No – single option; one out of multiple classes)
 - Free text comment
- Items can be annotated temporally for:
 - Entire video (i.e., global assessment)
 - Specific video segments (“phases”)
 - Time stamps
- Items can be annotated spatially using:
 - Freehand polygons (semantic segmentations)
 - Bounding boxes
- Annotation ontologies can be defined and associated to groups.
- Store and track annotation files that refer to the original raw file.
- Ability to export annotation files (temporal and global assessment only - not spatial)

SYSTEM SECURITY

- Follow local and international laws regarding patient privacy, confidentiality and data sharing specific to the geographic location from where the data was procured (e.g. HIPAA compliance for videos obtained in the United States, GDPR for videos obtained in the

European Union, Follow local and international laws regarding patient privacy, confidentiality and data sharing specific to the geographic location from where the data was procured (e.g. HIPAA compliance for videos obtained in the United States, GDPR for videos obtained in the European Union, etc.)

- PHI compliant
- Full site functionality via VPN (note: China, for example may not allow VPN)
- Industry standard authentication.
- New accounts must be approved by the global admin.
- User accounts are password protected.
- Role based permissions:
 - Uploading/viewing videos from user or user groups
 - Sharing videos (bidirectional)
 - Annotate videos (bidirectional)
 - View annotations by other users.
 - Create and manage users.
 - Run reports.
 - Export data.

Permission	Generic User	Rater	Admin
Upload and view videos on their own private workspace and share with other users or user groups.	✓	✓	✓
Control who can share videos with them (“discoverability option”)	✓	✓	✓
Annotate any video on their private workspace uploaded by themselves or shared by others, if permission has been granted by original user and/or Global Admin	✓	✓	✓
Download their personal data at any time.	✓	✓	✓
Rate VBAs		✓	✓
Provide Feedback on video assignments		✓	✓
Complete control and access over the system. Creates accounts for other users and defines permissions for the other roles and groups.			✓
Create annotation ontologies (e.g. VBA rubrics) which will be integrated into annotation tools in the Generic User Journey.			✓
Add sub domains			✓
Can delete data from any user account (note: deletions MUST be logged).			✓
Run reports and export data			✓

- Change log.
 - Changes to user accounts and files.

- API calls including timestamp and accessing user.
- Connect to user interface (Via web-based HTTP API)
 - Allow specific accounts to upload files.
 - Requires unique credentials.

III.II. CONSTRAINTS

The VBA System will support desktop browsing. The system must be compatible with all currently supported versions of the following operating systems: OSX (X86 and ARM), Windows, and the top four major browsers to be determined in five-year reviews. The initial system must be compatible with Chrome, Firefox, Edge, and Safari. As mentioned previously, the security and integrity of the content and data stored in VBA and transferred between partner systems is a high priority. SAGES expects proposals to reflect this.

AVAILABILITY

- The system is intended to be on for 24 hours a day, 7 days a week, and 365 days a year. There will be exceptions for predetermined and planned maintenance.
- The system resources must be maintained for timely and adequate response times from the software.
- Data should be immediately available for use, with the exception of User Profiles waiting for admin approval.
- The system will be housed in the cloud or cloud-like storage of the chosen vendor with security policies consistent with users' respective geographic privacy laws and regulations.
- Recovery Time Objective: 24-48 Hours
- Recovery Point Objective: 0 Hours
- Automated Backups: Daily

OWNERSHIP

- Stored surgical data ownership will be guided according to contractual agreements for intellectual property and consent forms from the source institution.
- Intellectual property of the System will at all times belong to the vendor.
- Intellectual property of annotated datasets, and other potential data derivatives will belong to SAGES and other potential co-inventors. The vendor will not have any claims to ownership. For all intents and purposes, the vendor will be a contractor whose services will be retained to develop and/or license an already-developed digital solution that accomplishes the technical requirements outlined in this document.
- The System is **Hardware-Agnostic** and can be utilized by any user regardless of how data was initially obtained or recorded. No additional hardware purchase is required.
- All data stored on the System, along with its annotations and other potential data derivatives will only be accessed by SAGES and its members and disseminated according to aforementioned checks and balances. The vendor cannot assume unrestricted access to any of the above.