



# White Paper

## A Video CareGiver Support System

### Abstract

This white paper describes iPOV's vision for a CareGiver Support System (CGSS) that leverages the technologies behind well-known video-sharing websites like YouTube. The system enables field and mobile healthcare providers to send and receive asynchronous video communications on a wide range of topics. The system requirements are modest: an inexpensive (under \$100) solid state camcorder and periodic access to a web browser with modest Internet connectivity.

While iPOV can deploy the underlying web software platform immediately, a sponsoring organization will have to build a 'community of stakeholders' to realize the system's potential. This whitepaper gives a high level roadmap to the system design, potential benefits, and the 'community development' process.

It is important to note that the CGSS is not designed as a synchronous ('live') communication system. The goal of CGSS is to facilitate routine reports and problem-solving at a distance. Ideally, that will free human resources to respond to more urgent threats and issues.

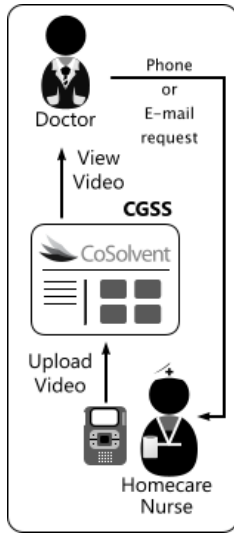


## Contents

Introduction.....	3
Application Scenarios.....	3
iPOV and the CoSolvent Platform.....	4
The Case for Asynchronous Video in Home Care .....	5
Community Development and Deployment .....	6
Community-Specific Software Customizations .....	8
Simplified Interface.....	8
Cell phone video .....	10
Access for Low Connectivity Users.....	10
Risks and Protections .....	11
Cost and Licensing.....	12
Appendix: CoSolvent Community Server Data Sheet.....	13



## Introduction



The CareGiver Support System is a highly scalable, low-cost web application that home-care industry stakeholders (nurses, families, doctors and organizations) can use to send and receive video asynchronous video communications on a wide range of topics regarding homecare. The system assumes the use of inexpensive (under \$100) solid state camcorders (e.g., [RCA EZ207](#)) and requires only moderate Internet connectivity.<sup>1</sup>

The system is a logical extension of the web video technology behind YouTube. IPOV has added features, security, operational controls, and tracking and reporting systems to safeguard commercial and technical transactions.

Deploying a CGSS requires a well-considered plan to motivate, enroll and train users. IPOV refers to the latter as a '**community development**' process. IPOV works with the sponsor's staff or independent consultants to jump start community activity. Typically, IPOV uses mockups, small-group brainstorming and stakeholder champions to determine the community needs that deserve initial support. IPOV will use the results from mockup testing to facilitate user buy-in.

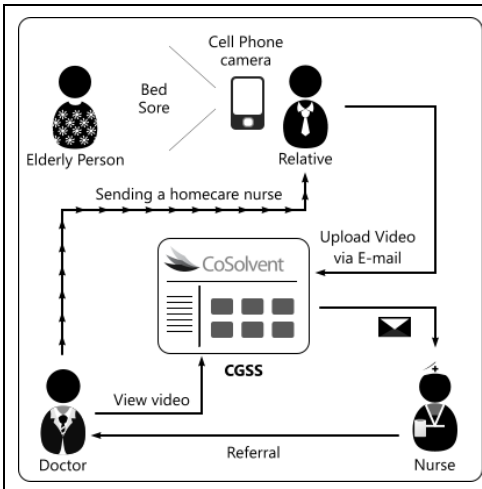
As part of the community development process, IPOV can offer several ways to expand the capabilities of CGSS to integrate members of the community with limited internet connectivity or familiarity. In dealing with patients in remote or rural areas, a CGSS should offer a very high return on investment.

## Application Scenarios

To appreciate the potential of CoSolvent in a CGSS role, it is helpful to review plausible scenarios. Each scenario has a companion set of operational assumptions, training requirements, security concerns and operational challenges. In the following examples, a simple dialog mechanism is repeated in many different forms. For this reason, on a purely technical level, CoSolvent can implement any of these scenarios right now.

Scenario	Description
<p>The diagram shows an Elderly Person with 'Difficulty swallowing pills' being visited by a Homecare Nurse. The nurse records this on a camcorder. At the Homecare Agency Office, the nurse uploads the video to the CoSolvent CGSS interface. The doctor then views the video, recognizes the problem, and makes a referral to a Speech therapist. The speech therapist then recognizes the problem and makes a home visit to the elderly person.</p>	<p>Homecare nurse notices that elderly person isn't taking medication. On questioning patient reports difficulty swallowing pills.</p> <p>Nurse video-records patient's attempt with pocket-sized camcorder.</p> <p>At homecare agency office, nurse uploads clip to CGSS and notifies patient's doctor.</p> <p>Doctor reviews clip and refers situation to a speech therapist.</p> <p>Therapist reviews the clip, recognizes problem and resolves it in two home visits.</p>

<sup>1</sup> Inexpensive cameras like these are surprisingly good. Many have low-light capability and good resolution. They are small and can be maneuvered for a good viewing angle.

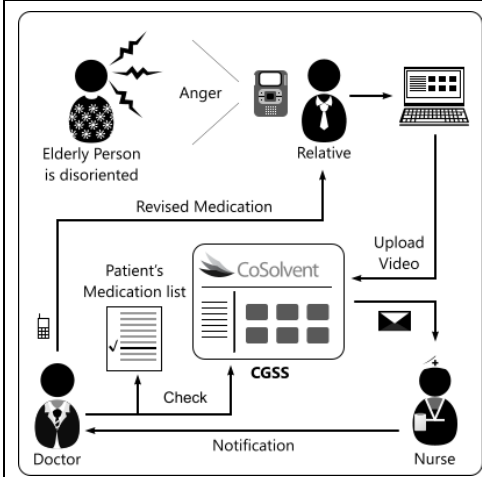


Elderly person has a bed sore. Relative uses a handheld camera to record a close-up movie of the wound.

Relative uploads video to CGSS. Email is sent automatically to Doctor's nurse.

Nurse informs doctor, who views video and prescribes a visit by a homecare nurse to the home.

Homecare nurse treats wound and bookmarks video clips on CGSS that show relative how to maintain treatment.



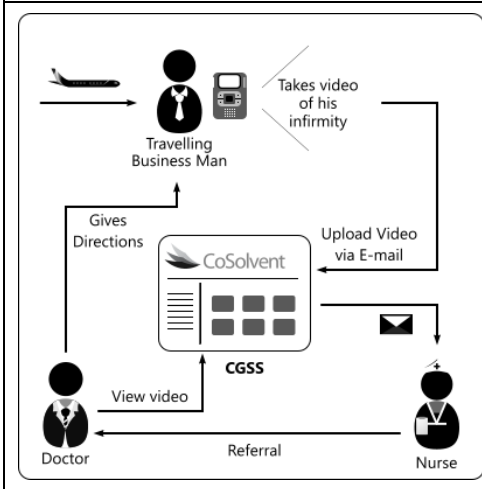
Elderly patient is disoriented and expresses periodic rage.

Relative (presumably with Power of Attorney) video records with patient where behavior is evident.

Relative sends video to CGSS. Nurse reviews video and passes to Doctor.

Doctor reviews medications and changes prescription.

Angry episodes are less frequent.



A professional travels on business to a remote country, where he contracts a medical condition.

A colleague travelling with the individual makes a video recording of the patient and his description of his symptoms.

The colleague uploads the video to the patient's account on the CGSS (or possibly a 'blind' general drop box account) from a nearby Internet café.

The professional's doctor views the video and, based on knowledge of the patient's medical history, offers advice on the best way to deal with the crisis.

Optionally, the colleague may upload part of the examination and comments from a local physician.

## iPOV and the CoSolvent Platform

interactive Point of View (iPOV) is a specialized eLearning and web video company in Auburn AL. iPOV understands the challenge of teaching non-professionals how to record knowledge with inexpensive video equipment and has proven many times that, with the right tools and guidance, **anyone** can make inexpensive, practical, validated video communications. Over the years, iPOV



has built a suite of software tools and specialized processes that collectively form a strong basis for rapid development of a video-based CareGiver Support System:



If a video-based CareGiver Support System were built from scratch, the effort would be significant.

However, IPOV has already developed and deployed an open-source platform, IPOV's CoSolvent Community Server (CCS).

CCS allows a controlled community of stakeholders to collaborate using a wide variety of rich media (including video).

iPOV currently offers CCS as a Software as a low-cost Service (SaaS) to organizations that encourage video sharing among trusted stakeholders.

Key features include:

- A Web 2.0 interface that requires only a web browser, an Internet connection and Flash. The https secure communication protocol passes freely through most firewalls.
- A flexible file and asynchronous video storage model that allows easy exchange of files and videos, with multi-level access control and permissions to keep files and comment 'conversations' private.
- Flexible alerts to potential viewers via email and automated notifications and user features include the ability to arrange, move, replicate, and replace files, do site-wide searches, add user-defined tags, and trade comments.
- IPOV has developed an advanced Flash video player that can perform advanced playback functions (including virtual cut and merge) after the movie has been downloaded to the user's web browser. By building the player into the CoSolvent Server, IPOV can explore novel web video-based features with server/client cooperation.

CoSolvent Community Server is the outgrowth of IPOV's long experience with eLearning and video production. IPOV has done more than 300 custom eLearning projects and web video applications for major corporate clients since 2000. **All of these projects used video as the primary intellectual raw material.** IPOV has pioneered tools and methods to transform virtually any type of video into high quality eLearning – quickly, accurately and at very low cost. IPOV has the skills, tools and software experience to rapidly assemble and deploy a credible prototype of the Video-based CareGiver Support System on the CoSolvent Community Server platform.

## The Case for Asynchronous Video in Home Care

There has been tremendous interest in the use of Internet technologies to extend medical and social services to previously hard-to-reach locations. The emergence of telemedicine, telecare, telehealth and various other types of 'tele' services have drawn a lot of attention.

To date, much of the attention has been focused on using video as a live interactive tool or a 'surveillance' tool, with an emphasis on streaming to connect the homecare setting to remote healthcare professionals. This is attractive to well-connected users (e.g. medical professionals) that can easily support synchronous (i.e., 'live) conversation patterns in their normal activities. However, when users attempt to connect to people with lower-quality or less certain connections, the difference in user ability and transmission speed is likely to create frustration on both sides.

Asynchronous exchanges (e.g., email and discussion boards), or near-synchronous exchanges (e.g., text chat) are often more comfortable for participants with modest or uncertain connection and PC capabilities. For example, numerous spontaneous communities and self-help groups thrive on message boards and blogs to help individuals cope with medical conditions. These file-based



exchanges are also more convenient. There is no need for precise schedules or appointments. A caregiver for an aging parent can send important but non-urgent questions and information at any time, even late at night. Answers can accumulate until the other party (e.g., medical personal or lay caregivers) can answer.

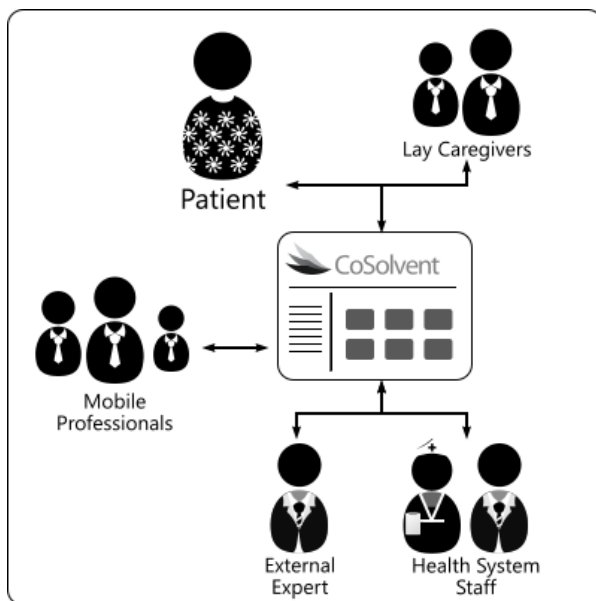
In short, from a technical point of view, low connectivity users can often do more with asynchronous communication because it allows the use of buffers, background downloads, off-line (physical) transfers of data, and other mechanisms that are not possible with synchronous communications. This may actually allow richer information to be transmitted between low and high bandwidth users.

As the cost of devices with good video capability (e.g., pocket-sized camcorders and cell phones) continues to fall, iPOV believes that asynchronous video offers attractive new opportunities, perhaps not in the same applications as streaming video, but for applications that are equally helpful and potentially just as important to managing healthcare costs.

Still, there is a long list of design requirements that any healthcare application must meet. The following sections discuss the key issues and the broad design concepts that iPOV is proposing to permit a CGSS to address these concerns.

## Community Development and Deployment

If iPOV's web-based CoSolvent Community Server is deployed under the control of a System Sponsor, community members can share video-based information with other system members - anywhere in the world. However, a patient-centered healthcare system has a lot of moving parts that can interact in a lot of different ways. The diagram below provides a very simplified overview of the major players.



A **System Sponsor** must fund and administer the video sharing site. A hospital, a state agency, a healthcare company or an insurance provider may assume this role.

The sponsor will typically employ or engage with a professional, medical **Health System Staff** of caregivers (e.g., doctors, nurses, and hospital staff).

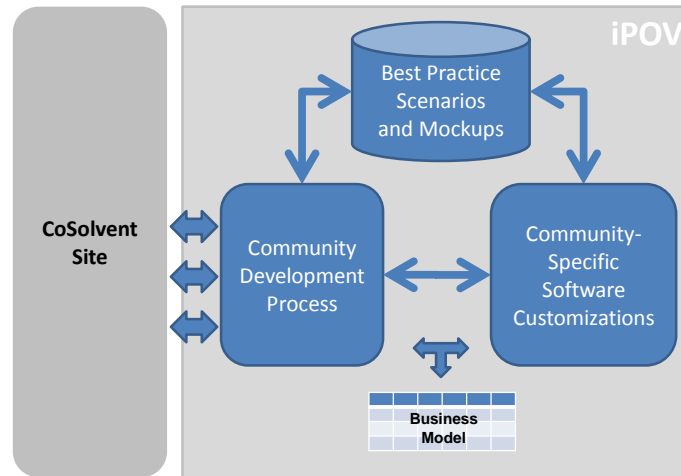
The **Patient** is the focus of the care. In most cases, the patient can interact directly with the system, but in some situations they may rely on **Lay Caregivers** (family members, assistants, etc.) that are authorized to communicate on the patient's behalf.

The lay caregivers are often supported by **Mobile Professionals** such as homecare nurses, OT/OP therapists, social workers and the like.

Finally, there may be the occasional **External Expert** whose input is valuable to the patient's welfare. One example of an external expert would be a local doctor that the patient visits if they have an issue while on vacation.

The design objective for the CGSS is to provide a flexible, low-cost way to facilitate visually rich communication among all of the stakeholders in this network. A great deal of medical information is visual or audible in nature. It would help everyone in the system if that type of information could be shared easily, quickly and inexpensively from virtually any location.

However, there is a big difference between constructing a website and solving the myriad organizational, support, education, and 'community development' challenges that must be overcome to make it safe and effective. iPOV's community development process is designed to uncover and address those needs. The program structure is shown below:



The process taps into the ongoing interaction between the site design, the community development process and community-specific software customizations. All of this is tied to an overall medical and business model for the system. The goal is to create a justifying rationale that is understood and accepted by all community stakeholders. The system sponsor can use that rationale to encourage community members to discover and share other valuable uses. The following steps illustrate a typical community development protocol:

- **Identify Business Goals** – The community sponsors must set the overall system goals, but recognize that community participants may have different agendas. The community developer will probe to find the set of application scenarios that offer the highest value to the sponsor and to community participants.
- **Find Stakeholder Champions** – Some people will imagine better stories, show more enthusiasm and offer more creative ideas. They are the ones to engage in early testing and feedback. These aren't the people that will ultimately need convincing in large numbers, but they can give context and frame the arguments for the larger population.
- **Scenario Development Session** – iPOV and the sponsor will conduct a brainstorming and testing session with selected stakeholder champions. We envision a 2 day event, with the first day devoted to discussion and brainstorming about the possibilities of remote reporting, problem-solving and communication. On the second day, participants try to mock up some of their own ideas in the existing CoSolvent Server.
- **Isolate Hot Button Issues** – It is hard for any community sponsor to guess the issues and concerns of individual stakeholders about a system that doesn't yet exist. One approach is to canvas potential users for 'hot button' issues. If a specific issue recurs, it is a priority target for process and software response. Solutions to hot button issue(s) should motivate more people to participate.
- **Build Best Practice Prototypes** – Develop working examples that address the hot-button issues. These examples would be used to educate and motivate a broader set of potential participants and solicit more concrete reactions.
- **Develop Enrollment Plan** – Public websites have voluntary enrollment. Corporate IT systems (e.g., hospital systems) enroll employees when they are hired. CGSS community sponsors will want 100% enrollment of their community members – but they have to achieve it over the public Internet and with non-employees. This is a very high bar. It will take an aggressive, well-considered rollout program to achieve that goal.<sup>2</sup>
- **Training (optional)** – It will be important to develop formal training materials and courses (preferably eLearning) to explain the system and showcase the best practices to new

<sup>2</sup> The underlying CCS can help with this process. iPOV has built a strong technical support tool into CCS that helps to test remote connections and diagnose potential connection issues.

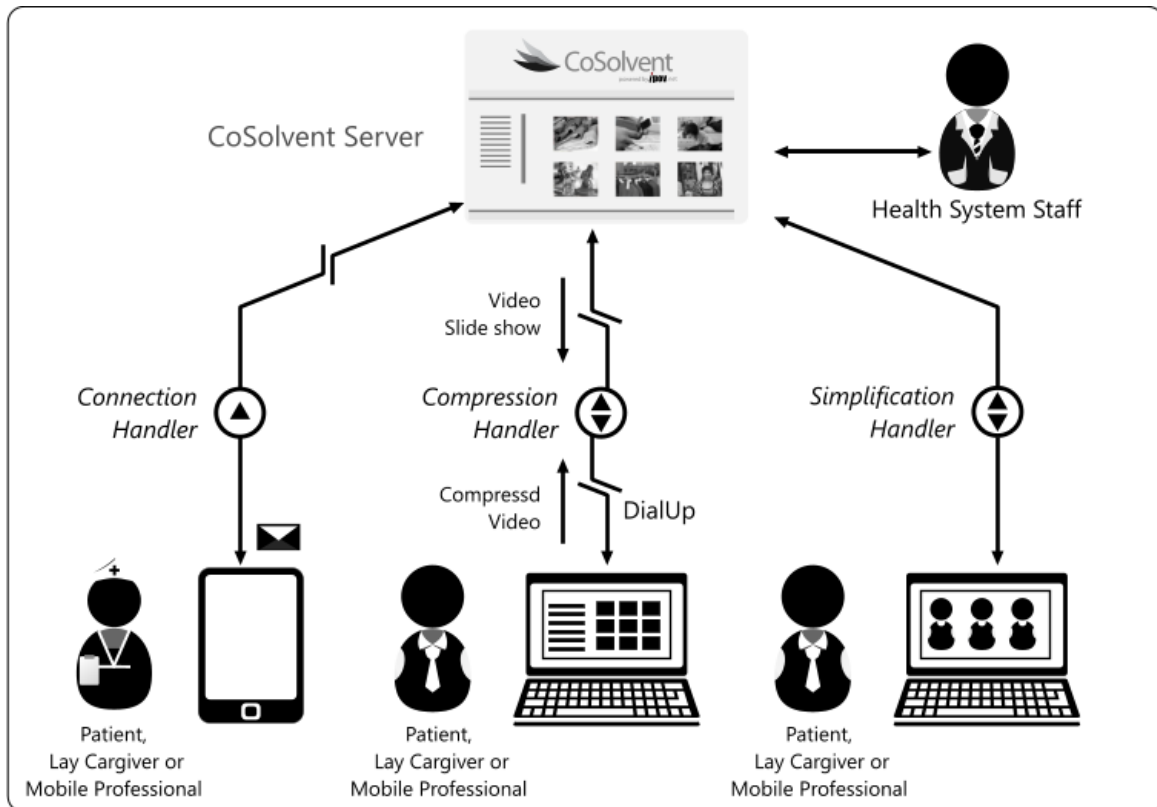


community members. Once enrolled, users can rely on the general help files plus the best practice prototypes.

- **Long Term Support** – As the long-term prospects for the community become clearer, it will become easier to estimate likely community turnover and the need for long-term technical and community development support.

## Community-Specific Software Customizations

The following figure illustrates some of the optional custom software features that can be added to CoSolvent to address structural and behavioral challenges in low-connectivity communities and among users with limited Internet familiarity. iPOV has anticipated requirements for these issues in the underlying design of CoSolvent, but the actual connection methodologies must typically be engineered for each community’s specific needs.

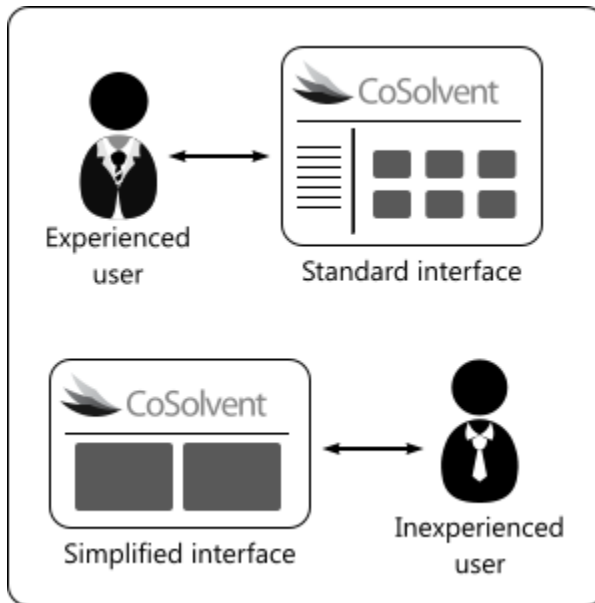


## Simplified Interface

The current version of CCS functions somewhat like an online version of Windows Explorer with special handlers for advanced media such as video. While this is a familiar mode of interaction to active computer users, the target demographic could include the elderly, their professional caregivers and family members. These people may be less comfortable with the standard metaphor.

For a given community, iPOV can develop a simplified interface that restricts the actions to the essential functions. As the diagram illustrates, the simplest interface could be just:

- Send
- View



The Send function creates a message to be sent (which may or may not include file attachments), a video to be uploaded, and text.

The View function allows the patient or caregiver to view the latest message and/or click through to a gallery of recent messages.

Prior to enrollment, the only option presented by the simplified interface will be to select the provider and upload a video Q&A to the provider for approval as a part of the enrollment process.

In order to safely use a simplified interface in a public healthcare application, the CGSS will require a carefully designed enrollment process that is more robust than the typical web application.

The exact procedure will vary depending on the makeup of each community, but it will approximately resemble the following sequence.

1. Health system staff or mobile professionals will initiate the enrollment process using the CGSS, with permission from the patient or from a person holding power of attorney. The staff or professional will conduct a two-stage process in order to enroll the patient.
  - Have the patient or PoA sign a written release stating that the patient agrees to undergo a videotaped Q&A session in order to be approved for CGSS enrollment.
  - Conduct the Q&A session on video and send it to the sponsor using the CGSS. This will establish that the patient has been informed that the patient understands the purpose of the CGSS and knows that they can ask that their records be purged at any time.
  - Depending on the operational plan for the community, this session might also train the patient (or authorized lay caregiver) to upload usable video.
2. The sponsor will be responsible for authorizing individual patients. An authorization will set in motion the following sequence of events:
  - The authorized Q&A is tagged and filed appropriately for the patient in question.
  - A new account for the patient is created within the CGSS which includes the patient's personal folder as described above.
  - An authorization code which will serve as a login credential to access the patient's folder via the Simplified Interface is generated and e-mailed to the caregiver using an address that was specified as a part of the Q&A upload.

Once this has taken place, the patient, mobile professional or lay caregiver can access the patient's folder through the simplified interface using the authorization code. Each user will have a personal folder in CGSS that is only accessible to:

- the patient/caregiver
- the patient's registered professional providers (health system staff and mobile professionals), using a separate provider's account.

For non-urgent issues, health system staff and mobile professionals can communicate with patients by uploading a response (video or comment) to the patient's folder using CGSS's Explorer-like interface. That will be immediately reflected in the patient's simplified View interface. Patients and lay caregivers can communicate with staff and professionals by using the Send function on the



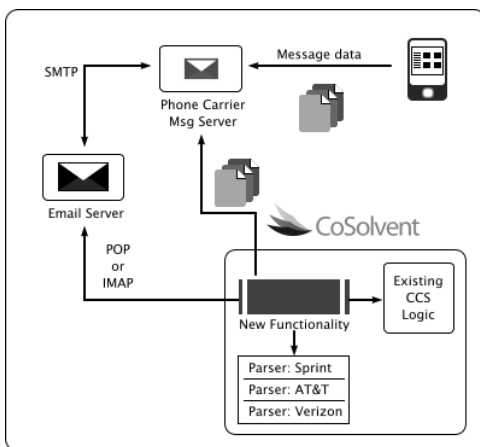
simplified interface. Behind the scene, this uploads material to the patient's folder on CGSS and sends a notification email to the staff or professional.

## Cell phone video

Cellular technology is more ubiquitous than well-connected personal computer technology, and is a relatively consistent and familiar method for many users, including the elderly and individuals with disabilities. The ability to record using a video enabled phone, and to upload directly from the phone using the phone's built-in e-mail functionality, might significantly reduce the learning curve for potential participants. Ideally, armed with a properly configured phone, a lay caregiver could upload a video to the patient's CGSS folder using only a few button presses (e.g. record, save, send).

From a technical perspective, Cell phones impose the following requirements:

1. The cell phone must be able to record video, and send it as an attachment to an arbitrary email address.
2. Ideally, the it should be possible to configure the phone to record, save, and send video to one of a pre-defined set of email addresses.



The most likely scenario would configure the CGSS to only respond to email addresses that match those registered in a patient's account. Additional safeguards, such as requiring a patient or provider's authorization code in the subject line, may also be desirable.

The content will be delivered to the patient's folder on the CGSS where it may be reviewed by an authorized staff member or professional.

Video-by-email handling is partially carrier-specific. E-mail formats tend to differ across the different wireless carriers.

iPOV will work with sponsors (and possibly consultants) during the community development process to establish the priorities for supporting e-mail handling for specific carriers and the level of handling and options that the community requires.

## Access for Low Connectivity Users

In addition to providing alternative means of input, iPOV may be able to improve the basic web video upload process in two ways:

1. Simplify the procedure for uploading video where a video-enabled cellular phone either is not sufficient, or is not available
2. Where a higher quality / longer duration video is required, simplify the procedure for compression and uploading to better accommodate low-connectivity scenarios

Cell phones are great for cases where a snapshot or short, web quality video is sufficient, but other cases may require a higher quality/longer duration video than the typical video-enabled phone can provide. It is iPOV's experience that inexpensive solid state camcorders are easy to use, but the procedure of transferring the resulting video to a personal computer and then uploading it for use on the web can prove daunting to the uninitiated.

In particular, the procedure may require that the video be compressed prior to upload. Even for tech-savvy users, video compression is a complicated subject. iPOV has customized a portable version of the Firefox web browser to compress video automatically before uploading it. This greatly reduces video upload times over slow connections.



## Risks and Protections

Using information technology in a health care environment poses a long list of potential threats and concerns. Resolving the issues in the following list establishes the high bar that must be met for any asynchronous video-sharing solution. iPOV has considered these risks in its design thinking for CGSS. Currently, we believe most of these risks can be resolved with a combination of prudent limitations on use, effective management procedures and incremental software customization. However, some of these risks will reflect community-specific issues and choices that can only be identified in a robust and thorough community development process.

:

1. **Failure to comply with informed consent legislation** – Informed consent must be recorded in the enrollment process. Video may, in itself, be a useful tool for this process.
2. **Failure to comply with data protection legislation** – The system will likely need distinguish people with a right to view data (patients, authorized caregivers and persons with Power of Attorney) and restrict everyone else.
3. **Data breaches** – Currently the data in CoSolvent is encrypted during transmission as well as in 'raw' form. The weakest link is likely to be inexperienced users who inadvertently expose their own data. It is an open question whether additional safeguards should stress software or management procedures, or both.
4. **Repurposing or secondary use of data (mission creep)** – We don't know whether the availability of large quantities of video will increase or decrease the temptation for its misuse (e.g., by insurance firms). On one hand, video may be very attractive as evidence (e.g., workman's compensation claims). On the other hand, privacy and access controls should be effective if deployed properly.
5. **The patient could be compromised** – The end user (e.g., patient or lay caregiver) is generally the weakest link in any security setting. They can give away passwords, upload material that is inappropriate or lose their login credentials. This will be a special challenge if patients and lay caregivers are given direct access.
6. **Equipment is damaged** – Since video is, by definition, easily inspected, data capture problems will tend to be caught quickly and the ready availability of low cost replacement equipment will limit the financial impact.
7. **Disruption of the service** – It is fairly difficult to disrupt a hand-held camera with a USB connection or a cell phone. Asynchronous video systems are generally less vulnerable to prolonged outages.
8. **Theft** – The required equipment is inexpensive and web servers are hard to steal. An asynchronous, web-based system should be less vulnerable to equipment theft.
9. **Inadequate provision or availability of medical services** – This is always a problem, but having a lower cost, a more accessible network won't make it worse. In fact, it should make it easier to allocate scarce resources more effectively.
10. **Human error in emergencies** – It would be unwise to rely on an asynchronous video system in an emergency. That may require policy and management control.
11. **The patient might misinterpret the data** – Video is a visible, non-synthetic view of what is/has happened and is much less prone to basic misinterpretation. At worst, a patient could make the same misdiagnosis that they would by viewing their own body.
12. **Health system staff might misinterpret, modify or delete patient data** – iPOV suspects (albeit without proof) that video is no more susceptible to misinterpretation. It is much harder to modify than normal data and as easy to accidentally delete.
13. **Users may not follow instructions** – The system presumes the use of video cameras with simple controls and simplified interfaces. Assuming that the system is not used as an emergency response system, the most that can be expected from not following directions is an inconvenience. However, the sponsor may have to dedicate labor to ongoing 'housekeeping' and 'user support' to minimize the problems that might occur.



- 14. Data surveillance and profiling** – A properly secured system should have few vulnerabilities, aside from insiders passing data to unauthorized parties. Because video files are big, cumbersome and require time-consuming human for interpretation, it is likely that more ‘packaged’ health data (i.e., databases with text contents) will be a more attractive surveillance target.

iPOV is very cognizant of the security concerns associated with the security and privacy concerns associated with standards such as HIPAA. Considering the added sensitivity of personal records in the CGSS context, iPOV has implemented aggressive security controls in the CGSS. In the base configuration, iPOV uses a variant of a ‘trusted business associate’ management model and backs it up with comprehensive file access logging. All system users will be prevented from seeing unauthorized materials by the permission and access control system. The sponsor’s system administrators will be few and will be bound by strict access guidelines that are enforced by comprehensive file access logging.

Currently, all traffic between the server and the browser is encrypted, but the contents reside in viewable formats on the server. However, depending on the concerns identified in the community development process, stricter security can be applied. For example, some communities may deem it advisable to encrypt content files from end to end, including when they are ‘at rest’ on the server.

iPOV can implement end-to-end encryption, but that raises other practical issues. Unless an encryption system is very carefully implemented and is carefully fitted to the operational character of the target community, there is a serious risk that, users will lose their security credentials and then lose access to their content altogether. There are a number of plausible lost-key recovery mechanisms, but they may also be vulnerable to user error with a community of less sophisticated computer users. For communities that serve lay persons (especially the elderly), the threat of lost data may be more worrisome than the threat of unauthorized access.

## Cost and Licensing

The CGSS is built on iPOV’s CoSolvent Community Server (CCS). CCS is a web application that iPOV hosts and maintains under the Software as a Service (SaaS) business model. The CCS software is open source and is built on a portfolio of high-quality open source projects, with several important iPOV-written additions. The SaaS Model for CGSS has four main elements:

- The software is free – All of the software for the CCS, including the parts written by iPOV, are provided under well-established open source licenses. When a client hires iPOV to host the system, the client gets full rights to the source code as it exists at that time and as it is upgraded under a paid hosting and maintenance.
- Cost of CGSS software, hosting and technical support - \$1.5 to 3K per month, depending on bandwidth usage, quantity of video, and level of required technical support.
- Cost of community development - \$4-8K per month in first year and \$1-3K per month thereafter.
- Cost of community-specific software customizations – can vary widely, from \$5K for a simple, unadorned installation up to \$100K for an extensively reconfigured and customized design.

For this cost, a healthcare network can expect direct savings in time and travel – cumulative over all participants. iPOV is confident that the savings and benefits will greatly outweigh the costs, especially when the server support costs are spread over a large number of patient relationships.



## Appendix: CoSolvent Community Server Data Sheet



CoSolvent Community Server (CCS) facilitates collaboration within a community of stakeholders.

Think of it as a combination of a 'private YouTube' and a 'shared network drive' that can store and display video and many other files.

CCS applies strong access and sharing controls to folders and notifies users about events of interest (i.e., file(s) or comments added to a folder).

CCS relies on simple web technologies that work almost anywhere - through firewalls, in other languages, and across oceans.

### Features:

#### Core Features

- Minimal Client System Requirements
- Flexible Video and Audio Support
- Works with Inexpensive Video Cameras
- Comprehensive Security
- Windows-like Folders and Menu Structure
- Public Sharing Folders
- Arrange, Move, Replicate Files
- Replace Files without Breaking Links
- Email Sharing
- Subscribe to Folder Changes
- Hosted Software as a Service (SaaS)

#### Other Features

- Administrative Tools
- Item-level Comments
- CoSolvent Flash Video Player
- Customizable Titles and Pages
- Multi-Lingual Interface
- Site-wide Search and Filtering
- Synchronized Video Subtitles
- User-defined Tags
- Thumbnail "slideshows" of each video
- Video-enhanced Context-Sensitive Help
- Video in Several Bandwidths

### Service Model:

Service Plan Options

- **Software** - Free and/or Open Source (mostly GPLv2 with some minor variations).
- **Dedicated Server Hosting and Maintenance (\$1500/month)**
  - Hosting on dedicated Amazon EC2 instance
  - Backup and security management
  - Regular upgrades as iPOV innovates
  - Email support and bug fixes
  - Initial site customization and graphics
  - No limit on number of users
  - 250 GB storage, 1000 GB bandwidth/mo

iPOV will host and maintain the basic server on a fully dedicated Amazon EC2 instance. Client has total control of site, including master server accounts and passwords.

This provides the greatest level of flexibility, independence, security and control.
- **Shared Server Hosting and Maintenance (\$400/month)**
  - Like dedicated, but shares an EC2 instance
  - Minor limitations related to IP addressing
  - No limit on number of users
  - 50 GB storage, 300 GB bandwidth/mo

The client site shares a server with up to 6 other sites – with no logical or data connection between any of the sites. However, iPOV retains control of master server accounts.
- **Shared Server Hosting and Maintenance - Per User Pricing (planned – not yet available)**
  - Shared server services
  - Monthly per-user fee
  - 5 GB storage, 40 GB bandwidth/mo./user

Same as shared server, but fees are assessed on a per-user basis.
- **Optional Tech Support (\$1500/month)**
  - Phone support to designated user admin
  - Site management consulting

iPOV provides extended support services through a client-designated administrator.
- **Optional Community Development Services (ask for quote)**
  - Assist client with community development
  - Customize software to serve unique needs

iPOV can help clients design and deploy a server that exactly fits their operational needs.