White Paper
A Video Food Safety Support System

Abstract

This white paper describes iPOV's vision for a Food Safety Support System (FSSS) that leverages the technologies behind well-known video-sharing websites like YouTube. The system allows participants in a global food supply chain to communicate quickly and easily with one another about complex technical and procedural issues – with just a web browser and inexpensive, hand-held cameras.

While iPOV can deploy the web software platform immediately, the sponsoring organization must build the knowledgeable 'community of stakeholders' that can realize the system's tremendous business potential. This paper offers a general roadmap to the 'community development' process and examines the potential benefits that it can deliver.

It is important to note that the FSSS is not a system that is designed to detect willful fraud. The FSSS can, at most, play a supplemental role in that regard. The goal of FSSS is to facilitate the performance of routine cooperative audits and problem-solving at a distance. Ideally, that will free precious human resources to respond to other, more complex, threats and issues.

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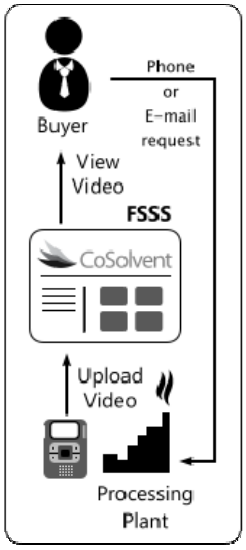
Introduction



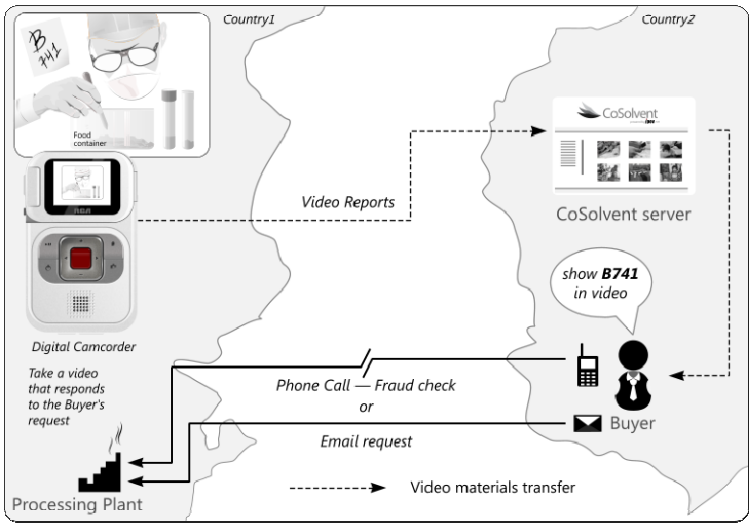
The Food Safety Support System is a highly scalable, low-cost web application that food industry stakeholders (agencies, companies and organizations) can use to send and receive video responses to process and technical questions. The system assumes the use of inexpensive (under $100) solid state camcorders (e.g., RCA EZ207) and requires only moderate Internet connectivity.[1]

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

Deploying an FSSS 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 create model examples to facilitate user buy-in.

Application Scenarios

To appreciate the potential of CoSolvent in an FSSS role, it is helpful to review plausible scenarios. Each scenario has a companion set of operational assumptions, training requirements, security concerns and operational challenges. The first scenario shows the basic transaction that forms the core of the system.



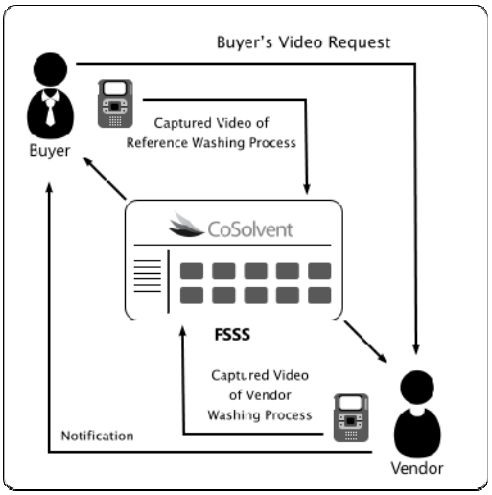
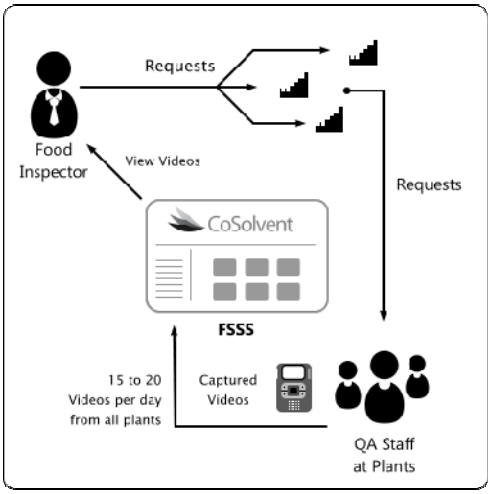
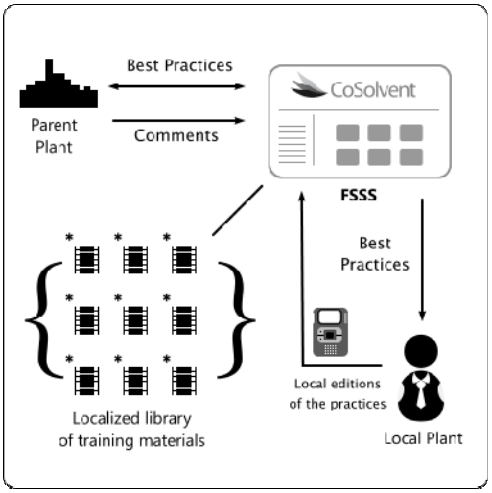
In the diagram at left, the buyer asks the vendor a technical question that can be fully or partially answered with a video clip.

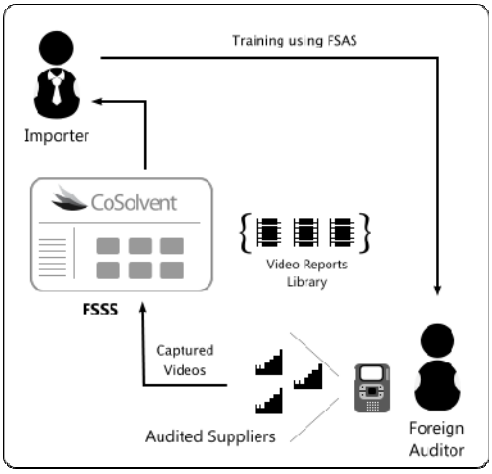
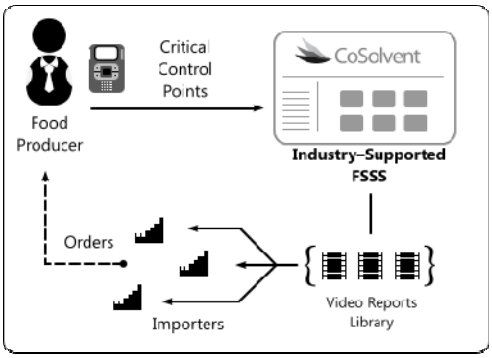
The buyer asks the vendor to perform a visible action (e.g., show a supplied code number) while filming the clip. The presence of the requested action stamps the response as having been made after the request.

The upload time marks the end of the response time window.

[1] 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.

In the following examples, this 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
	An American meat company is evaluating a rural processing plant as a potential vendor. The buyer asks the plant to make a video of their carcass washing method. After reviewing the video, the buyer asks its own processing plant staff to record a best-practice video and upload it to the buyer's FSSS. The buyer emails the links to the potential vendor to clarify the washing standards that are expected for potential future orders.
	A state food inspector emails requests for information to plants in his/her territory. Each request has a question that the plant cannot anticipate. For example, the plant must visibly display an inspector-supplied code number during their video response. The plant QA staff uses a $70 solid state camcorder to record a demonstration of their answer to the question. They upload it to their account on the state's FSSS. The inspector can request and review 15 to 20 video clips (average 5 minutes each) per day. These frequent surveillance questions offer expanded inspection coverage between in-person inspection visits.
	The expat manager of an American-owned startup plant in Mexico is bringing the new production system online. The parent company helps by sending video clips through FSSS showing best practices at its flagship US plant. The manager shows the videos to his staff and they design solutions that fit local conditions. The manager uploads these to the FSSS. Experts at the parent receive email notifications for each clip and respond with comments and videos of suggested improvements. The final versions form a localized visual library to help train new workers in the Mexican plant.

	An American food importer has engaged a contract audit service in China to audit several supplier plants. The importer has trained the audit service to use the importer's FSSS. On plant visits, the auditors routinely record video clips of the plant setting, processes, and procedures of interest. The auditor typically uploads these to the FSSS from the plant, a hotel or whatever Internet café happens to be nearby. The importer maintains the library of these video reports for QA documentation purposes and also to help it design its contractual requirements for future supplier contracts.
	A Tanzanian food producer wants to sell in the American market. Knowing that food safety is critical, the vendor records a series of video clips with a plant tour and detailed explanations at critical control points. The vendor registers on an industry-supported FSSS and uploads the clips from a nearby Internet café. The vendor emails the video links to potential buyers. The videos generate interest that provokes an in-person site visit and eventual orders.

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 Food Safety Support System:

If a Video-based Food Safety 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 search, 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 Food Safety Support System on the CoSolvent Community Server platform.

System Design

Inspecting and auditing for food safety issues has drawn attention from industry, media, the public and government. The widely publicized accounts of melamine adulteration and e. coli in peanut factories have generated growing public demand for more aggressive inspections and stricter accountability.

The demand for safety frequently conflicts with another public demand – the desire for a wider variety of inexpensive food. Food suppliers are being driven to seek out more sources, in more countries, in more remote and less economically developed parts of the world. Food companies must manage suppliers who are farther away, have weaker scientific infrastructures, operate by different business and social cultures, and often speak a different language.

Modern food safety quality assurance systems are built around four basic elements:

- A well-specified 'product standard' – e.g., the Codex Alimentarius
- A comprehensive quality management system standard – e.g., HACCP, ISO9000
- A growing portfolio of scientific testing technology
- A robust system of training and compliance auditing

None of these items, by themselves, is sufficient to protect the consumer. Together, they can complement and reinforce one another to offer an impressive level of protection. However, if you omit even one of these elements, it will leave a gaping hole that virtually guarantees food safety problems at some point in the future.

As the supply chain expands, it is harder to maintain a balanced portfolio of protection elements. Global sourcing of complex food products is a long, multi-stage, multi-country, multicultural supply chain. This creates a complex visibility and communication problem, especially in developing economies. Until distant suppliers can provide greater transparency, can apply reliable testing methods, can deploy more sophisticated IT, and can establish more credible systems of traceability, food quality and safety must rely on the ability to supply good training and build verifiable trust. FSSS makes it much easier to share timely technical knowledge and to strengthen the training and trust relationships that are increasingly critical to effective assurance.

The Challenge of Long Distance Trust-building and Training

Trust-building and training grow more expensive as the distance between supplier and buyer increases. The costs increase if the parties face serious cultural and language barriers. The

situation gets worse still if the remote supplier operates in an immature commercial system with a weak technical infrastructure. The challenges that buyers face fall into three categories:

- How do you reduce the cost of training remote suppliers?
- How do you reduce the cost of getting information from remote suppliers?
- How can you influence or change the behavior of remote suppliers?

Sending Information to Suppliers

The companion to auditing is the 'corrective action' that must follow to make sure that the audit findings are taken to heart. For remote suppliers, this generally means offering them better technical guidance, clearer commercial instruction, and better training.

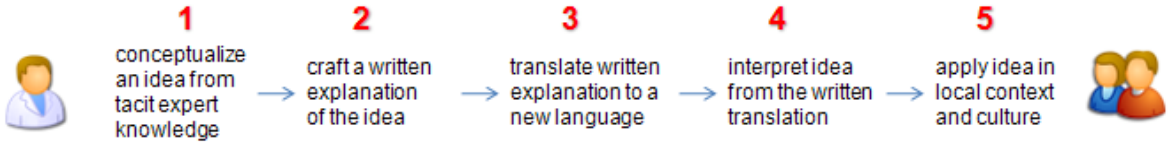
With long, multinational supply chains, the challenge is to do this quickly, accurately and at a low cost. iPOV strongly believes that web-quality video holds the greatest immediate promise to make this happen. In particular, we believe that video has two characteristics that are especially valuable and too often overlooked; language transparency and accuracy.

Localization

The CoSolvent platform can be extensively localized to many different languages. With the strong i18n tools, iPOV can quickly add or update text to adapt to specific requirements or addition of new features.

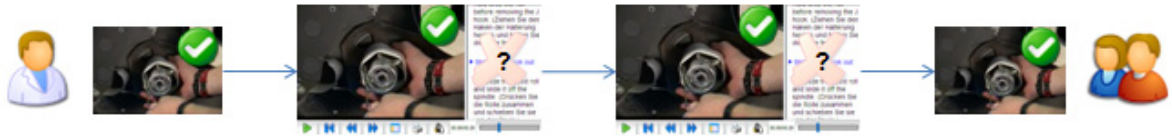
Video Speaks Every Language

iPOV has extensive experience publishing video technical documents and eLearning materials in a number of foreign languages, and it has developed proprietary systems and software tools to help in that effort. However, text translation is imperfect. There are at least 5 distinct intellectual steps in the process of sending text-based expert knowledge to someone in a different language and culture. Each step demands the engagement of a motivated, knowledgeable expert to move the information forward to the next stage.



Each step is also a potential 'single point of failure' that can threaten success. Worse, if something goes wrong, no one may spot the problem until the error is seen in the performance at the other end. For communications concerning food safety, the consumer could become the ultimate victim of any miscommunication.

A better approach is to ask the subject expert to demonstrate some part of the procedure in front of a video camera. It takes little, if any, training to use a low-cost video camcorder in this way. Ideally, someone knowledgeable would attend and ask probing questions. Later, if required, the expert's commentary can be transcribed and translated and uploaded to the FSSS server.



In this method, the visual part of the message remains constant through every stage of the process and into every language version that is produced. In other words, the video portion **is immune to error** over the entire transmission process. If a translation mistake occurs in the voiceover or in the companion text, iPOV expects that most viewers will believe what they see in the video – as they should. Even better, they may ask for a clarification. The video helps to protect the accuracy of the entire communication.

Finally, most technical experts cannot be fluent in every target language. This means that they can't know if their words are translated accurately until the observed behavior at the destination confirms success or raises a suspicion. If the expert and the recipient can view the same video clip on a web server, the expert will at least know that the video portion arrived intact.

Video is Self-Validating

Apart from its resistance to linguistic and cultural interpretation, video has a special value for the communication of procedural information in a quality system. It is too easy for an expert to write a procedure that is impossible to perform. They may forget to explain a key step. They may omit a critical measurement. They may write a description that has more than one possible interpretation. All of these can produce instructional documents that are wrong.

Proofreading alone can't catch all of these mistakes, because it requires active interpretation of the written word, itself a point of possible failure. The proofreader may imagine the process being done one way and miss a plausible alternative that would generate a bad result. This is especially true for those physical procedures that are hard to describe in prose. Consider writing an unambiguous work method explaining how to make a Windsor knot in a necktie.

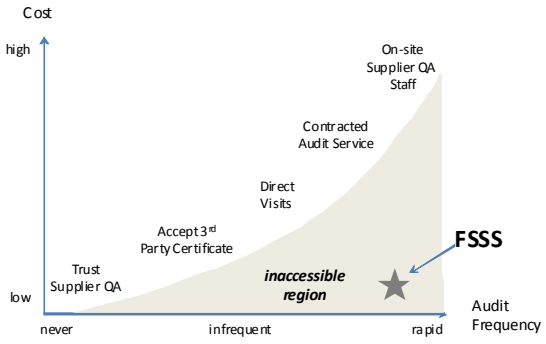
Video explanations have inherent clarity and fidelity. If you record a video of a work procedure being performed from start to finish, critical steps cannot be omitted and the procedure's validity is self-evident from the procedure's outcome. In effect, video procedures are inherently self-validating. With video, most serious problems, such as an important step being obscured during filming, are visually evident and are likely to be caught immediately or in an early review.

Getting Answers from Suppliers

The FSSS is not designed to detect willful fraud. iPOV has built some safeguards into the system to make misrepresentation more difficult, but the FSSS will, at most, play a supplemental role. It is mainly conceived as a tool to make it easier to perform routine cooperative audits and problem-solving at a distance. Ideally, that will reinforce trust-building and free precious human resources to respond to the most serious threats and issues.

Modern quality management standards call for audits to assess the existence and effectiveness of a 'quality management system'. These 'management system audits' are less concerned with finding specific mistakes or defects and more concerned with learning whether the supplier has the required skills and is using them in a good faith effort to deliver the quality that was agreed upon.

In most situations, there is a correlation between the frequency of the audit review and the cost. The conceptual diagram below shows the cost vs. audit frequency for five common options: a) trust the supplier without audit, b) accept 3rd party certifications, c) conduct in-person audits, d) hire a local audit service, and e) station buyer's QA staff on-site.



The shaded region has historically been inaccessible to vendors or buyers.

In that region, buyers would be able to audit their suppliers' processes cheaply and often, and vendors would be able to offer high levels of assurance to all customers. Everyone would benefit if this region were feasible.

The FSSS lets distant buyers ask and answer process questions at very low cost. Symmetrically, suppliers can answer and ask questions from distant buyers quickly, convincingly and inexpensively.

The idea is simple. Ask the remote supplier a question, and a spontaneous, non-professional video provides an answer that is fundamentally more believable than any emailed report or memo. Cutting the time and cost for answers carries a value in its own right. Consider what it would mean to have an historical series of video Q&As, recorded at fairly frequent intervals, touching on a variety of subjects. While a single video may be inconclusive, a series will paint a meaningful picture, even if a

video response simply raises a flag that something is happening: a new face giving the commentary, new equipment in the background, more or less dust and grime than usual, a new sense of assurance, or signs of tension and confusion. Any savvy professional can read the tea-leaves.

Fraud minimization

As stated previously, the FSSS isn't a silver bullet against fraud. It is a tool for efficient communication and performance improvement in cooperative relationships. Nonetheless, iPOV has identified some simple, low-cost fraud minimization techniques that should offer significant protection against misrepresentation. Our low-tech approach has three related safeguards:

- **An initial 'trusted' video tour of the remote plant or site.** For example, it may be advisable to start each 'virtual auditing' relationship by having a trusted party video record a thorough plant tour. The video would be a point for comparison for any later videos. The goal is to make it harder for a vendor to record a video somewhere else and pass it off as having been recorded at the target location.
- **Control the video acquisition time window.** This is easily achieved by noting the time at which the request was sent (presumably electronically) and the time at which the respondent began to upload the video response. That establishes the time interval during which the respondent must have generated their response. The buyer can also press the vendor to respond quickly. While it is very hard to generate a convincing fake for 5 minute video in 30 minutes, that is plenty of time to record and upload a legitimate one.
- **Test against use of stock or 'sanitized' video in responses.** A respondent might try to send a 'sanitized' video clip that was made at some earlier time. A very simple safeguard is to request that the vendor perform some arbitrary physical action in the video clip. It might be as simple as asking the vendor to show a sheet of paper with a random 4-digit number that was given in the email request. It could also be anything (e.g., 'hold up today's newspaper' or 'slap table 3 times' or 'turn around in a circle' or …) that the vendor cannot guess it in advance.

Taken together, these safeguards should make it fairly difficult for a vendor to pass off a fake.

Auditing the auditor

Cost pressures have prompted many food purchasers to rely on 3rd parties in the source location for local assurance and training. Yet, these services are, themselves, subject to training and trust concerns. How do you know that the auditor is competent or thorough? How do you know that there is an arms-length relationship between auditor and target supplier? You probably have to travel and make a personal assessment of the third-party – then hope that assessment holds up in day-to-day operation. If the concern is fraud, the FSSS may not be decisive. However, if the problem is related to lack of knowledge, misunderstanding, or a communications breakdown, frequent, two-way exchanges of YouTube-quality video should speed problem correction and make everyone feel more secure.

Communicating Scientific Tests

This paper concentrates on human-scale activities because these can be recorded accurately with a video camera. However, scientific tests are an even more critical aspect of food safety and most occur inside instruments or at very small scales that a standard video camera cannot see.

As more scientific instruments are linked to PCs, there may be a way for the FSSS to help. iPOV has extensive experience with screencast movie software that records software and computer activity, along with audio from a connected microphone. One of the best of these tools, BB Flashback, recently introduced a free version of their recorder.[2] Depending on the food science involved, it is conceivable that buyers could request to see movies of PC-based scientific tests. It would be easy to test this idea as part of a broader community development effort.

[2] http://www.bbsoftware.co.uk/Products.aspx

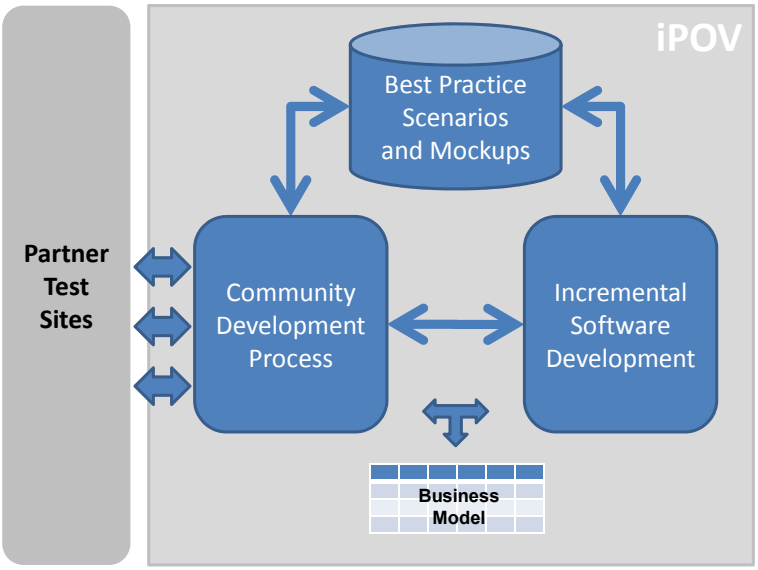
Changing Behavior

Studies of adult training, including studies of food safety training, have consistently shown that front-line workers require active, hands-on engagement in order to absorb new technical knowledge. Sending a memo, or even one video, isn't enough. If you want new knowledge to cause a permanent change in behavior, you must require or empower the workforce to use that knowledge in normal, day-to-day activities. Sustaining the pressure to achieve permanent change is expensive at the best of times. It becomes prohibitive as the target grows more remote.

With an FSSS, it is quite feasible to make and trade video clips several times per day. iPOV now does that routinely in its eLearning production business. If this type of video 'swapping' were embedded as a standard practice, managers hundreds or thousands of miles away would be able to 'work a problem' with a remote workforce until they were sure that the behavior was fully embedded – without ever stepping on an airplane.

Community Development and Deployment

Once iPOV's web-based CoSolvent Community Server is deployed, the sponsoring organization can use web video to improve trust-building and deliver verified training to suppliers anywhere in the world. However, there is a big difference between having a working website and solving the myriad organizational, support, education, and 'community development' challenges that must be overcome to make it commercially effective. The 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 partner test sites, the community development process and (possibly) incremental software development to establish the viability and popularity of at least 2 or 3 scenarios that can provably deliver value. All of this is tied to an overall business model for the system. The goal is to create a justifying rationale that is understood and accepted by stakeholders, then encourage them to discover and share other valuable uses. The following steps illustrate a typical community development protocol:

- **Identify Business Goals** – The community sponsors has to 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 ROI 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 auditing 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. However, the protocol will have to be very general, since each application scenario will be different. An auditing model will likely generate reactions that differ from a marketing application.
- **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 enroll employees when they are hired. FSSS community sponsors will want 100% enrollment of their external stakeholders – but they have to achieve it over the public Internet. This is a very high bar. It will take an aggressive, well-considered rollout program to achieve that goal.[3]
- **Training (optional)** – Depending on the mission, it may be necessary to develop formal training materials and courses (preferably eLearning) to explain the system and showcase the best practices to new community members. In other cases, the general help files plus the best practice prototypes may be sufficient.
- **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.

Cost and Licensing

The FSSS 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 FSSS 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.
- Hosting and maintenance service – iPOV charges a monthly fee for hosting and maintaining the CCS. The main elements of the service include:
    - Hosting on a dedicated instance in Amazon's EC2 grid server system, with data storage on Amazon's S3 distributed, redundant storage system.
    - Monitoring of server operations, including security issues, backups and bug fixes.
    - Periodic upgrades to implement new and improved versions of the underlying CCS.
    - There is no per-user fee. However, the hosting and maintenance fees will reflect the bandwidth, CPU usage and volume of stored materials.

[3] 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.

- Technical Support service – iPOV will provide business day telephone support to a client administrator. iPOV will provide email support to end-users via the embedded technical support menu.
- Customized Software Development (optional) – Generally, iPOV plans to maintain progress on the CCS technology roadmap and supply those innovations automatically as part of its hosting and maintenance service. However, individual clients may have special requirements that iPOV will entertain as bespoke programming.
- Community Development Support service – iPOV will work with the system sponsor to design a program to build awareness, interest, capability and usage for the system. This is a cooperative effort, with iPOV providing consulting, guidance and possibly software customizations to support a sponsor staff champion or possibly an independent consultant.

The details will vary from installation to installation, but the following summarizes the ballpark costs and benefits. These include iPOV costs as well as direct costs, savings and benefits that will likely apply to the sponsoring organization:

- Cost of FSSS software, hosting and technical support - $15 to 40K per year, 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.
- Direct savings in travel – e.g., $7,500 per person-trip to China, multiplied by the number of trips avoided per year.
- Benefits from better communication and assurance – as much as the sponsor wants to make of it.

iPOV is confident that the savings and benefits hugely outweigh the costs, especially when the server support costs are spread over a large number of buyer/vendor relationships.

Answers to Likely Questions

Q: What if a supplier resides in an area with poor Internet connections?

It will take them longer to respond, but low-cost camcorders are very mobile. Worst case, they can take the camera to a nearby Internet café for uploading. Buyers will have to understand local conditions to decide the proper response time allowance.

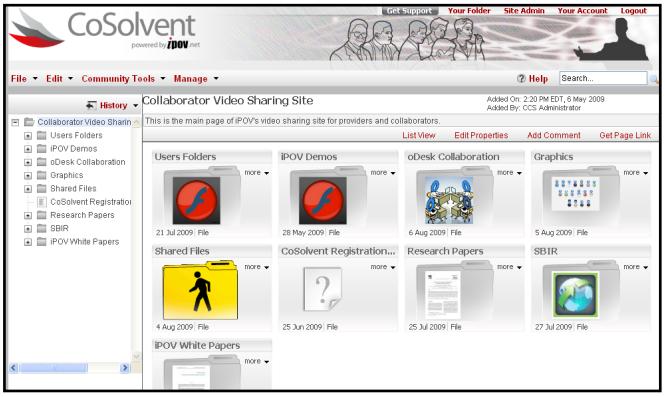
Q: What if the supplier has proprietary processes?

This would have to be negotiated between the buyer and seller. Since the seller has the camera, they should be able to answer most questions without showing critical secrets.

Q: How would you handle a non-responsive supplier?

We don't know. That would be one of the questions for the community development process. It may depend on the product and the parties involved.

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:

- **Software** - Free and/or Open Source (mostly GPLv2 with some minor variations).

Service Plan Options

- **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.