GLOBAL COLLABORATIVE TECHNOLOGY FOR FASHION PRODUCT DEVELOPMENT MEETING

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ABSTRACT

An important factor for the success of globalization of fashion is the application of interactive remote communication technology, known as collaborative technology. In this article, we shall present how we can apply technology to support multiparty web-based communication for fashion product development meeting.

When the designers are miles apart, it is possible to have the two or more identical physical samples ready on hand, before they can discuss in the video conferencing session. However, with today's data compression technology, it is possible to compress the digital images, such as the close up photos of the sample, and video clips, such as the live video recording session of a live model, so that information can be sent via Internet. Furthermore, using video conferencing equipment, designers can discuss interactively and freely, based on the digital information. In another scenario, if only illustration is available, the designers can still share the drawing files by using remote communication software, so that they can annotate on the drawing and clarify the communication.

Nowadays, more interactive mode of communication is in great demand. There are a few commercially available systems allowing users to interactively communicate across the Internet at the price of the Internet surfing fee, such as the monthly subscription fee of the ISP (Internet Service Provider). In this article, we shall present a working model of global interactive communication procedure for hosting fashion product development meeting. We shall also compare some of the existing and popular commercial packages.

1. INTRODUCTION

In the age of globalization, international enterprises typically distribute their talents worldwide to capture the best of what the world can offer. For example, an international fashion company may set up design head quarter in Paris or Milan, with a network of freelance designers. The company may have the several sourcing centres located in different parts of Asia with respect to the product lines or material lines. The company's manufacturers may be even widely spread all over the world, according to the product lines, such as cotton T-shirts in China, linen shirts in India, fashioned knitwear in Hong Kong, leather jackets in Korea, and trousers in Indonesia. Even in the case of small and medium enterprises, they may still be working in a similar set up, except the supply chain is not integrated under the same company group.

The communication of such a complex and physically distributed supply chain network is a challenge to all levels of personnel within the supply chain. In a simplified version of a supply chain of a fashion item, one can easily identify the parties involved in the process, as in Figure 1. The process starts with the design team, which is typically composed of a design manager and a group of designers. They work together to develop the first batch of prototype samples with the assistance of the sample room and live models. Once the prototypes are ready, the sales manager pre-launches the product line and tests the order. Then, the actual production starts. The quality of the

work-in-process is examined and assured. The shipment is inspected and delivered.

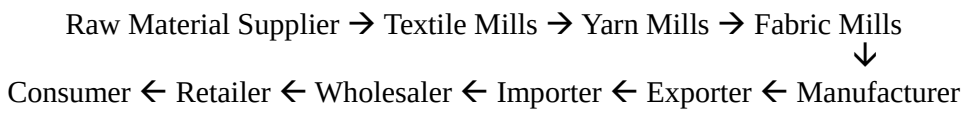
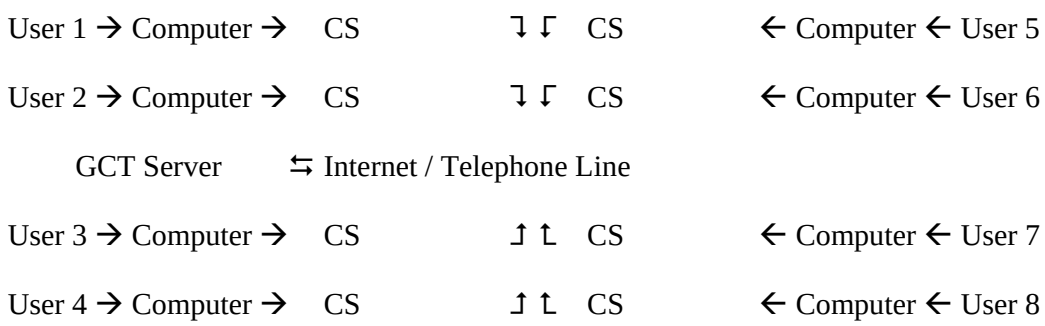


Figure 1. Simplified Supply Chain of a Fashion Item

Even in such a simplified supply chain, the communication process can be very complex and expensive if the parties are physically remote from one another. In order to save the time and effort to meet in a single location, global collaborative technology must be used. Such equipment functionally compromises a video conferencing unit, a chat room unit, a remote controlling unit, a sharing unit, a timing unit, a recording unit, an interfacing unit, and an administrative unit. The schematic diagram is displayed in Figure 2.



[Note: GCT: Global Collaborative Technology, CS: Collaborative Software Computer includes web cam, speakers, digital camera, digital video recorder, etc.]

Figure 2. Schematic Diagram of a Global Collaborative Technology

In the next section, we shall describe a product development scenario, where global collaborative technology can bring value to the users and the business. We shall further quantify the benefits. Then, through this description, we can extract the useful features of the global collaborative technology. Finally, we shall propose an economical alternative for the users to try out at practically no cost, except there are many limitations. Consequently, a reliable and full-featured commercial system is indispensable to the next-generation leaders of the industry.

2. PRODUCT DEVELOPMENT SCENARIO

ABC company is a lingerie company that is based in Europe. Her production is based on Asia, with the buying office located in Hong Kong SAR. ABC's product line covers not only the mass market, but also the mama size and pregnant women. The brand image of ABC is primarily based on the excellent fitting, although the product is also known for the fancy materials and design. The company has a major market share in Europe.

Every year, the company launches four seasons and the product development process is jointly operated in both Europe and Hong Kong. The current practice is as follow:

1) Design team in Europe develops the illustration;
2) Sampling team in Hong Kong SAR develops the prototype samples;
3) Prototype samples are shipped to Europe for mock up by live model;
4) Second set of prototype samples are made according to the comment received and are shipped to Europe for trial wear by live model;
5) Finally, the full size-set of samples are made and are shipped to Europe for further trial wear.

The Hong Kong team has to travel to Europe three times a season. In each travel, two staffs, sample room manager and the senior pattern designer, travel together. They typically spend five working days in each trip working and two days of traveling time. Such a frequent traveling plan is not avoidable at this stage, because firstly there is no supply of live model in Hong Kong, particularly in the mama size and pregnant size; secondly the grading is highly nonlinear, and thirdly the styles change every year.

With the current arrangement, the communication problem is solved at a high cost. It is proposed that virtual fitting software, such as V-Stitcher, could be used as an alternative. That means the live model in Europe should be digitized by a 3-D body scanner. Their data cloud is then transmitted to Hong Kong, so that the pattern development team can use the virtual fitting software to test the fitting. Theoretically, it is a sensible solution. However, a live model is still more superior because she can provide verbal feedback, which is beyond the software's capability. Consequently, the cost is estimated at Euro$5,000 per trip, or Euro$15,000 per season or Euro$60,000 per annum (Table I). In other time of the year, all communications are based on fax and Email, supplemented with IDD phone conversations.

Table I. Cost of Fitting Trip

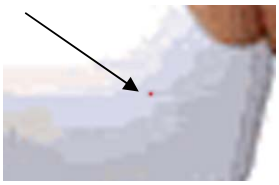
Staff	Air Ticket	Accommodation (5 days * Euro$100)	Local Travel Allowance	Food and Travel Allowance (6 days * Euro$50)
Sample Room Manager	Euro$1,500	Euro$500	Euro$50	Euro$300
Senior Pattern Designer	Euro$1,500	Euro$500	Euro$50	Euro$300
			Freight of Samples	$300
			Total	Euro$5,000

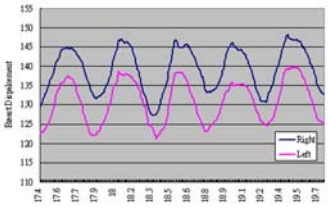
2.1 Product Development Scenario with Global Collaborative Technology

With the assistance of the global collaborative technology, the product development process can be more efficient. In the first and second trial, the sample room manager and the senior pattern designers stay in Hong Kong and communicate with the designers in Europe via the global collaborative technology. However, in the final trial wear, it is still recommended to travel in person, because it is the last chance of communication before the bulk production. Based on this estimate, only Euro$15,000 is needed per annum - a total saving of Euro$45,000! A narrative example is listed in Table II.

Table II. Sample Dialog of Product Development with Global Collaborative Technology

Person	Speech	Screen	Action
Jim (Sample Room Manager)		Roger (Senior Pattern Designer) is already on the screen, sitting in another room (place).	Dial ip of Tom (Design Manager)
Tom	Bonjour, Jim.	In coming call FLAG Jim shows up on screen	Accept call
Jim	Bonjour, Tom. Bonjour, Roger. Have your received the samples?		
Tom	Sure! Alice (live model), please step in front of the camera.		Zoom in the camera and focus on the bust.
	Jim, the bust shape is little bit strange. We need some reinforcement.		Freeze the camera. Annotate on the strange area.
Roger	The sewing edge of the pad is too sharp. We can use a softer seam treatment.	Alice leaves the camera	
	We have included a pad 2G3-A in the package. Remove the current pad. Try 2G3-A.		Tom zooms in again.
Tom	Can we enhance the silhouette further like this?		Freeze the camera. Draw the new silhouette line on the bra.
Roger	Try the pad 2G4-B		Release the freeze

Person	Speech	Screen	Action
Tom	Superb! Next one. Amy please come on in.		
Jim	Tom, can you zoom in the left side of the cup. Is that a red dot? What is it?		Tom zooms in. Annotate the red dot.
Tom	Sorry. That's the nail ink of the model. However, the fabric has some shading problem.		
Jim	Sorry, it is not very clear on my monitor		
Roger	I can see the difference. Jim, have you calibrated your monitor? Simon, can you send us the swatch again?		
Simon	Here you go.		Upload swatch file. Unfreeze camera.
Roger	Got it. We'll check with the supplier.	In-coming file FLAG	
Jim	Is the bra comfortable?		
Amy	The elastic upper band and under band are both a little bit tight.		Amy moves to the front of the camera and the terminal
Roger	Can you put on the motion sensor and do a jumping?		

Person	Speech	Screen	Action
	Jim, can I have the control over Simon's desktop?		
Jim	Sure		Release control
Roger	The bouncing wave is very good. We'll do further analysis on the data		Upload the displacement map as a data file
Jim	Finition. Thanks Simon. Au revoir		
Simon	Au revoir		

From this sample session, the global collaborative technology brings all three parties, Jim, Simon and Roger to a virtual meeting room, where information, visual images, audio messages, files, and other media can be exchanged seamlessly. Jim and Roger can visually examine the garment being worn by the live model. Not only the silhouette of the bra, but also the details of the fabric can be inspected. More important, the live model can report verbally to describe how comfortable she feels. The sample session even demonstrates the application of high-tech equipment of motion sensing, which can be remotely controlled by Roger. Subsequently, the data can be sent by to Hong Kong via the file uploading capability of the global collaborative technology, as if everyone is in the same physical conference room.

2.2 Implementation of Global Collaborative Technology

The proposed global collaborative technology requires many components. Each computer is equipped with a web cam with a microphone and speakers. Each system must be connected by either the Internet or a direct IDD data line. On the transparent side, there is a global collaborative technology server, which is another computer collecting all the incoming signals and distributing the results to each of the connecting computers (Figure 2.). On Simon's computer, a digital video recorder and the motion detection system are attached. All the monitors should have been calibrated by using the Spy X Professional of Data-color System (2006), except Jim forgets to do so. That is why he is not able to see the shading.

In the global collaborative technology, the software component provides the control of the attached peripherals, such as the digital video recorder, digital camera, and microphone. The software must further provide the remote control of the desktop by any users connected within the session. Without such capability, Roger will not be able to operate the motion capturing system remotely and release Simon from the technical aspect of the equipment. Another important software capability is the freezing of the digital image and annotating accordingly on the image, because most of the visual communication can hardly be described precisely just by verbal messages.

Economically, if the whole communication process can be executed on the Internet, the cost is very low, with main cost being the subscription of the global collaborative technology service. However, if the communication process must be carried out on an IDD line, the cost is extremely high. The sum is comparable to the traveling cost. In such a case, the saving is primarily on the traveling time.

3. FEATURES OF COMMUNICATION

In a complete system of global collaborative technology, there are many types of features and equipment components. They are listed in Table III.

Table III Features of Global Collaborative Technology

System	Mode of Communication	Description
Users	Video Conferencing	Multiparty conferencing; Report duty and discussion;
	Digital Photo / Video	Show photos / video of the sample;
	Annotation	Point out important features;
	Network folder	Upload and download documents;
	Remote Control	Control the program available on other users;
Server	Audio-video Signal	Collect and distribute audio-video messages;
	Chat Room	Collect and distribute text messages;
	Annotation	Compose digital video images;
	Network folder	Upload and download files;
	Remote Control	Control remote desktop;
	Privacy Control	Control proper authorization and privacy;
	Administrative Control	Set up and support the session;
	Time Control	Time stamp all details;
	Interfacing Control	Allow record keeping and export of data to other management information software.

A global collaborative technology system is a fully integrated system that offers all of these features in a seamless way. The important advantages of such a system over other stand-alone are the abilities to increase reliability, reduce cost, and to interface with the management information system, so as to transfer all the important data, such as the time stamps of each of the communication details.

4. COMPARISON OF COMMERCIAL ALTERNATIVES

When comparing the commercial alternatives, there are five main factors: (1) price, (2) number of parties, (3) speed of transmission, (4) reliability of transfer, (5) ease of use. Factors (1) through (4) are interdependent. The Factor (5) is the minimum requirement.

Typically, it can be very economical to install the one-to-one asynchronous communication, as there is free email service in the Internet, and Windows XP support FTP service. The only small difficulty is the security requirement. If the data files are sensitive, higher measure of security is needed. Special services, such as Lectra-on-line (LOL) (2006), are available for communication of the PDM and other related files, with time stamp verification and notification.

However, for the synchronous mode, it really depends on the number of parties involved. For example, in the one-to-one synchronous communication, a very popular and reliable software, ICQ (2006) is originally text-based messaging system. Today, it also supports the one-on-one web conferencing. Another example, the MSN Messengers is also free option. As long as both users are using Windows XP with MSN Messengers (2006), and with a set of video camera plus headphone and microphone, they can conduct web conferencing without paying any additional subscription. The MSN Messengers also support file transfer, white board. The Enterprise version of MSN Messenger can allow higher security. Of course, as we all know, the speed of Internet connection varies according to the traffic condition. Therefore, the performance and the reliability cannot be guaranteed.

A free-for-personal use software for remote desktop control is VNC (2006). This software allows users to remotely control another PC over the Internet, with proper password control. It can be activated via the IE or Netscape, or VNC Admin Console (2006). VNC also comes in an enterprise version, which will then be charged for the license fee. A similar product is PCAnywhere (2006), or GoToMyPC (2006)

Another software that can run on the Internet is the PolyCom (2006). The one-on-one desktop model is the ViaVideo and the office model is the VSX3000. These equipments can support many-parties-video conference call. This is the standard solution for most business application. The PolyCom can support all the mentioned features of the synchronous communication, such as multimedia transfer and sharing of files and data, except the remote control of the computer desktop.

In fact, the one-on-one solution from PolyCom is not very expensive. However, if multi-parties-video conference call is needed, a video conferencing server will be needed to manage the signals. Furthermore, if the user demands high reliability of the system, PolyCom also supports communication via telephone line, instead of Internet. In such case, the price can be quite high, as the telephone company will charge the monthly installment fee for the dedicated data line, and each overseas call will be charged

accordingly. So, the phone line solution may not be a good choice for SMEs (Small and Medium Enterprises). In fact, the hardware cost for multiparty conferencing can be quite expensive, especially when a voice-tracking camera is used.

It must be stressed again that these captioned systems are stand alone and many of them are free of charge. They can offer partially the features of the proposed global collaborative technology, but they are not integrated; they are intended to work with two parties, and they cannot interface with any management information system. These are the drawbacks.

While many business collaboration needs could be satisfied by stand alone and free services, there are some business interactions that could benefit and gain cost-effectiveness in collaboration by subscribing to higher-end and scalable commercial services. The growing demand of higher-end commercial Web conferencing services is evident by the growing businesses of pricey service providers such as Webex (2006) and Microsoft Live Meeting.

Webex is the Web conferencing services market leader in the U.S. with over US$300 million annual turnover. Its business has a 25% cumulated annual growing rate. The recent acquisition of intranet.com by Webex to supplement synchronous collaboration with asynchronous sharing support is an indication of the industry trend in providing integrated synchronous and asynchronous collaboration paradigms. This acquisition allows Webex to offer share folders and calendars in addition to sharing applications or presentations.

Microsoft Living Meeting is based on an acquisition of a privately held company called Placeware. The price tag of the acquisition was estimated at a few hundreds million dollars. While Microsoft's acquisition of Placeware was aimed at enhancing the Microsoft Office suite to support synchronous sharing, Placeware was a major Webex competitor in the general Web conferencing industry.

Occasionally, SMEs have to collaboration with larger companies in their respective supply chains. Unlike many SMEs, larger corporations normally have certain information security policies and infrastructures. Security infrastructures aim at blocking some of the free services for virus and other hacking. Only some higher-end commercial Web conferencing services could work with the large companies to lower the barrier of using synchronous collaboration with their SMEs business partners globally.

One should note that commercial Web conferencing services have market visibility in some industries but it remains a well-kept secret to some others. Even though it is already a $0.5 Billion industry, real-time synchronous collaboration technology is still an active research and development area. In order to move into the mainstream, Web conferencing technology has to improve in scalability, performance, reliability, security, pervasiveness and ease of use.

5. CONCLUSION

Global collaborative technology is a powerful communication system. It allows users to host virtual conferencing without any physical limit, except connected by either phone or Internet. In this article, we have presented a scenario, where fashion product development teams consisting of the design team, the sample development team and the live models can work together to examine the fitting of the bra. In such activity, not only audio-visual communication is made easy, but also other forms of media can be exchanged via file transfer over a transparent network is supported. Most important, such a system can be practically free-of-charge, if only two users (location) are involved in the communication. It is worth trying under a two-party-call environment. When more parties are required, the user can then consider moving to the more powerful and integrated system.

6. REFERENCES

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