

File:of011-011-ishtar case history.doc Type: Page: 1 / 5	ISHTAR Project - Contract IN31018I	L.Update: 28/11/01 17.48 Printed: 19/12/01
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Case history of ISHTAR

Innovative SHop for Textile and AppaRel industries

The Ishtar project pertains to the European textile-clothing sector and aims to test new technologies in the production of "made-to-measure" garments. The injection of technology to realize "made-to-measure" garments at an industrial level has the purpose to offer the customers a strongly custom-made service at reasonable costs and time.

The "made to measure" approach is one of the ways identified at a European level to face the competition with countries with low labour costs; besides, it allows this industrial sector to shift from an offer-driven approach to the production on demand, resulting in clear benefits for the consumers and a drastic reduction of stocks and unsold goods.

For these reasons the EDP structures of the pilot users were strongly involved in the definition of the architecture and in the validation of the system, together with the technology suppliers of the project. The Ishtar Project has been partially funded by the Innovation programme of the IV Framework Programme of the European Commission.

The problem

The introduction of the made to measure approach in an industrial framework has relevant benefits but faces various kinds of obstacles:

- The supplier of garments needs to reduce the delivery time (time is lost processing the order and customising the garment model for the cutting machines) and the risk of errors in the measurements sent by the retailers (a relevant part of the garments require adjustments). Furthermore the supplier must avoid orders on fabrics that are not available in his stocks.
- The retailer organisation (shop), like the supplier, needs a defined and reduced delivery time and few sizing errors with personnel that has not the taylor skills; furthermore the large organisation requires a low cost to replicate the 'made-to-measure' corner, low cost to create catalogue and, mainly, for its maintenance; finally the process to manage the order of 'made-to-measure' garment is quite different from the usual ones, must be monitored, fast and based on a single piece, so the large organisations need to create a special channel to manage the data of this service.
- The sales representatives: have the same problems of the shops plus the needs to exchange easily data with the head quarters.
- The Internet channels of sales, alone, is not capable to generate a return to cover the investment (and is not appreciated by the customers that want to touch the fabric).

Finally, from a technological point of view, it is necessary to consider that large organisations (suppliers and retailers) have quite different Internal Information Management Systems that must be independent and loosely coupled and that the connections are easy only if based on the Internet protocols (HTTP and FTP, for example).

Description and objectives of the project

To face this challenge the project realizes a system of production and sale for "made to measure" garments. It is Internet-based and unifies the procedures and the supports of three sale channels: the traditional one in shop, the one carried on through a network of sales representatives to customer's home and the third one directly by Internet.

In the process implemented by the system, the final consumer chooses the garment (alone or with the aid of sale staff, according to the distribution channel), by selecting, from an electronic catalogue, the model, the fabric, the accessories and the personalizations.

File:of011-011-ishtar case history.doc Type: Page: 2 / 5	ISHTAR Project - Contract IN31018I	L.Update: 28/11/01 17.48 Printed: 19/12/01
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To guarantee the delivery time, only the choice of fabrics is allowed, the availability of which is previously checked, through exchanging of XML booking messages, with the producer's warehouse.

The system supports the collection of measures (that can be the ones referred to the customer's body or modifications on a reference model) and of the adaptations necessary to the model, using also a 3D body scanning system (when in shop); however, the reliability of the measurements is checked using a control knowledge base.

Once the order is completed, the producer's information management system acquires and launches it into production and, starting from the chosen basic model, automatically prepares the customised nexting plan of the fabric for the cutting machines.

Organizational impact

The system directly involves two actors of the Textile/Clothing supply chain: the Garment Supplier and the Retailer, allowing them to exchange complex orders by electronic way and to optimise the sale by sharing information about the available fabrics in the store.

Considering the distribution, the innovation can be seen on several perspectives: at the beginning, a commercial structure can easily start offering a "made to measure" service without changing the organisation of the existing sale channel, considering the system as a flexible and self explaining support; in perspective, however, it is possible that the marketing policies can create far more sophisticated and fanciful synergies between the various sale channels.

A flexibility element lies in the fact that the two sides of the system, vendor and producer, are technologically independent and only constrained to exchange messages in XML format according to a quite simple procedure.

The experimentation of the system has foreseen the involvement of two different sale organizations and a producer of "made to measure" garments (that are pilot users of the project) during regular sale operations with real customers.

Critical points

A first critical point is the virtual representation of the garment and, above all, of the fabric. The adoption of sophisticated technologies has been balanced and verified with the aim to have an easy updating of the catalogue (every 6 months about 150 fabrics change) and to use simple standard browser for the visualization.

The second one is that of versatility and opening towards other actors: at the moment, international standards for data exchange, between producers and distribution, to represent the data of "made to measure" garments, do not exist; the system uses XML messages of public format to allow any company to send or receive the orders, either if provided with automated information management systems or with human operators entrusted to read and switch them.

At last, the use of Internet as sale channel (the only case in which the final customer is alone in front of the monitor): this channel has been considered remunerative only if activated in synergy with other sale channels.

Project results

Achieved results/benefits inside the pilot user organisation/activity

Retailing organisation

From the point of view of the retailing organisation the made-to-measure process is performed with a lower rate of errors and customer claims.

File:of011-011-ishtar case history.doc Type: Page: 3 / 5	ISHTAR Project - Contract IN31018I	L.Update: 28/11/01 17.48 Printed: 19/12/01
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The electronic support of the navigator reduces the possibilities of errors in the order management process and allow a reduction of the time necessary to delivery the garment (also thank to the fact that orders are issued only on fabrics in stock); the tools to check the sizes and the alteration of the models required by the customers are another powerful tool to reduce the risk of errors.

From an organisational point of view, the system allows easily to monitor the status of orders and reduces the paper circulation with a gain in terms of speed and reliability of the workflow; furthermore, once the system has been set up, the replication of the system (that is based on standard Internet browser on standard PC) is easy and cheap and with a very low cost of maintenance for each point of sale (when using the Body Scanner the installation begins more sophisticated and costly, obviously).

The sales representatives can work with their mobile computers that are easily updated at the beginning of the day. The system can easily maintain an up-to-date image of the central archives of the retailer and of the supplier. On the other hand, to maintain cheap and lighth the installation, some of the graphical features, like texture mapping, are not available on these machines.

The same system can be used indifferently to support corners in the shops, Internet sales and sales representatives with only few changes related to the identification of the customer and order confirmation for the Internet sales and for the database replication for the sales representatives.

Clothing supplier (Hitman)

Loading the data for the order processing subsystem and the catalogue (images and data related to fabrics and models –both technical and commercial information-) required some time to the personnel of the stylist of product office, but has allowed a more effective control about orders insertion.

In the point of sales, the availability of fabrics is checked automatically with the navigator and the order is sent in electronic format. Thus the customer service personnel do not needs to check availability or to load the order by hand. The orders are issued only on fabrics that are available in stock. The host computer automatically compiles the basic list of products necessary for the production.

The measurements related to the customer sizes have been automatically checked in the retailing phase, with the navigator module, together with the customer, so that the customer service is helped in its activity that previously was totally hand made and without the possibility to measure again the customer.

Thank to these improvements, the launch of production is performed in the same date of the order arrival. The loading of the data in the CAD/CAM module (FITNET2) can be automatic and produce the altered nexting plan for the fabric cutting machines.

The production of made-to-measure garments in Hitman, normally, requests 18 working days (Lead time); the orders received from the Ishtar point of sale take 15/16 working day, with a reduction of the lead time of 2-3 days.

The detailed results

The ISHTAR catalogue (Neosis www.neosis.pt)

The core of the Ishtar system is a high quality catalogue of suits and fabrics, accessible via Internet, with specific functions for the use in shop, at home via Internet or on the mobile PC of a sale representative. Through the functions of the catalogue, it is possible to select and choose the garment model, the fabric and its personalizations (from the seams to the kind of buttons). For each model and each fabric, images of details are available together with sketch and commercial information which are shown assuring the realistic appearance of the colours.

File:of011-011-ishtar case history.doc Type: Page: 4 / 5	ISHTAR Project - Contract IN31018I	L.Update: 28/11/01 17.48 Printed: 19/12/01
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Through the pages of the catalogue the user accesses functions to take measures, to build and send orders, to manage a customer archive. A powerful backoffice function allows the quick personalization and maintenance via WEB.

The calibration and image visualization system

One of the aim of the project has been to guarantee that the colours of the images displayed to the user were as much faithful as possible, also without resort to expensive calibration equipment.

To do this, the CNR - ITIM institute (), on behalf of ENEA, has defined an acquisition procedure for images with commercial scanners and has developed two originals *applets*, for the calibration of the monitors and for the visualization of the images, which can be used by any Internet- enabled personal computer.

The calibration happens interactively with the involvement of the user and processes either internal information (the characterization of the best known kinds of monitors or of light sources like office fluorescent lamps) or feedbacks that the user provides answering to the application requests. Then this information allows the visualization applet to correct the colours appearance of the video fabrics.

The on line texture mapping system

This module applies fabric images on photos of garments models; in this way, it is sufficient "to apply" a fabric to obtain a realistic simulation of a model realized with it (the real production of such a model with that fabric results not not necessary with an evident saving of costs and of raw materials).

The system is based on an adaptation for the WEB of a commercial design product that was developed on behalf of Gruppo COIN. The system resides on a server and makes the 'photographic' image available to whoever can access it by browser, that is the result of the combination between model and requested fabric.

Principal purpose of this module is the reduction of the complexity of the operations of maintenance and updating of the catalogue in an industrial sector where the variability of the fabrics is very high, compared to that of the models; a second purpose is the reduction of the sample garments, also for the producer, since the system is able to simulate the appearance of suits which actually exists only in few fabric typologies.

The module to assist in the measurement, BMA (CadModelling www.cadmodelling.it)

The BMA (Body Measures Assistant) assists in the measurement of the body sizes of the customer; the data collection form dynamically shows graphic examples of the measurement modalities and incorporates check information to signal possible mistakes or values to be checked carefully.

The measures acquisition system or Body Scanner, ScanFit (CadModelling www.cadmodelling.it)

ScanFit is a system to acquire anthropometric measures (Body Scanning developed by Cad Modelling and modified for the Ishtar system. It is based on the theory of the anthropometric conformations and allows, in a very short session, to detect in a non invasive way the person's measures. It allows the collection of the body measures necessary to the manufacturing of a "made to measure" garment and automatically passes them, through the BMA module, to the Ishtar subsystem for the creation of the order.

The order exchange and management system

File:of011-011-ishtar case history.doc Type: Page: 5 / 5	ISHTAR Project - Contract IN31018I	L.Update: 28/11/01 17.48 Printed: 19/12/01
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The order exchange system and the check of store availability for fabrics are based on an XML message exchange procedure between the producer's information management system and the vendor's Ishtar system.

The exchange of messages takes place either to verify the store availability of the fabrics to be showed to the customer (booking a certain amount of them if necessary) or to send the order provided with the measures and the possible adaptations and personalizations requested by the user.

The systems of producer and vendor are technologically independent and are constrained only to the XML messages exchange according to a defined sequence. Although an EDI version of the messages exists it has not been used.

The information system of the pilot user, which is a producer, has been modified to allow the automatic receipt of the XML order and its launching into production, without altering any technical data, with a suitable intervention on the management system (STEALTH) realized by the company CSC Veneto on behalf of Industrie HITMAN.

The CAD-CADAM Fitnet2 module (Lectra, www.lectra.com)

For the Ishtar project, Lectra has completed its pre-existing module for the creation of model nexting plans for "made to measure" garments; Fitnet2 is now able not only to accept changes of measure calculated on the basic model, but also to directly receive the absolute measures requested by the customer, that are used to calculate the changes to be made on the basic model. Such pieces of information are then sent to the automated cutting system. The module is also part of a package (Fitnet Server) that Lectra offers as "made to measure" solution.

Reference WEB site

<http://spring.bologna.enea.it/ishtar>

Involved Partners

- ENEA (I), technology supplier and coordinator, italian government agency with experience in technological transfer projects
- AlFerano (D), pilot user, small retailing organisation specialised in the direct marketing and distribution of made-to-measure garment
- Cad Modelling (I), technology supplier, small enterprise, expert of anthropometrical identification/classification and supplier of the automatic sizing system
- Gruppo COIN (I), pilot user, a large scale retailer with a chain of over 45 stores
- Industrie Hitman (I), pilot user, large scale producer of garments
- Lectra Systemes (F), technology supplier, manufacturer of CAD-CAM systems for the industries
- Neosis (P), technology supplier, a software and service provider for application based on electronic commerce