Improving the Quality of Life for the Ageing Population using a Technology Enabled Garment System:

Smart Design Realisation for the Active Ageing

The ‘Design for Ageing Well’ cross-disciplinary, collaborative research project embraces developments in smart textiles and wearable technologies, and novel garment manufacturing techniques, that provide value-added attributes in everyday clothing to benefit the new consumer majority, the active ageing. This initiative highlights the value of design in promoting practical research outputs that are attractive from technical, aesthetic and cultural perspectives.

This research has demanded hybrid methodologies to be adopted in the merging of the disparate cultures, language and terminology of textiles, clothing, wearable electronics, communications and health and wellness.

Through the adoption of a collaborative design-led process, working prototypes are being developed with researchers, industry partners and older research participants. The iterative cycle has been driven by stakeholder engagement from the identification of user requirement, to initial range planning with concept drawings, to garment cut and fit, technical specification to inform garment engineering and the incorporation of technologies, through to verification of the usability of the garment prototype system and of the technology interface.

The resulting practical design outputs constitute a functional sports-type garment layering system, with integrated wearable technologies, that has the potential to promote autonomy, independence, healthy exercise, social engagement and wellbeing, with a focus on varying levels of participation in walking.

The design-led process has identified the importance of suitable visual references and descriptors, in plain language, explaining theoretical and practical findings from this complex collaboration that may be understood by a breadth of stakeholders from disparate disciplines and cultures.

To enable the uptake of this smart textile-based research, designers and the product development team must address challenges within the current culture of the global textile and clothing chain. This project, with regular stakeholder engagement, introduces a co-design process that aims to promote a more sustainable design culture.
One of the most exciting areas of garment design engineering is in the area of seamfree and seamless knitting.

Santoni circular knit provides the facility to zone certain stitch structures and yarn properties around the body to address the demands of protection, movement, moisture management and other requirements in well designed body fitting garments.

Base layer garments, especially for the active ageing, benefit from the added value of encapsulated products and finishes to make fabrics more quick drying, breathable and supportive in enhancing overall comfort.

(Concept development in collaboration with Lenzing)

“It’s fantastic that the garments can be knitted in one piece to fit exactly.”
Smart Technology into the Active Layering System

Range Planning

Range planning of smart textile driven garment layering system is informed through quantitative and qualitative methods in capturing user needs.

3D Development

Extensive co-design workshop evaluation with the older research participants and range planning activities are used to prioritise user design preferences. The block patterns developed from full body scans are combined with the designer style interpretations of user requirements from a technical, aesthetic and cultural perspective. The result is a detailed pattern development is used to inform the stage of garment prototyping for participant fitting and to specify the placement of both the technology and its user interface.

Design Specifications

Outcomes from design iteration, 3D development, digitisation and prototyping combine to inform production of detailed design specifications. These are produced by means of a collaborative process across the design team to ensure the co-ordination of design elements throughout the layering system.

Digitisation of Patterns

Effective placement of embedded technology within the garments is enhanced through the use of pattern digitisation. This also provides extreme precision in determining the cut and fit, the detailing and co-ordination of the clothing layering system as well as bringing the benefit of easy re-use and re-purposing of the patterns. The digital process enables the refinement and transfer technical data from product to product.

Prototyping

User evaluations are carried out with participants who have been engaged throughout the duration of the project. These outcomes gauge user friendliness, usability, reliability and robustness of the prototype to inform user acceptance of the technology as well as aesthetic value. Further development is undertaken to eradicate known issues within the system based on the user feedback. This is a key element of the overall iterative design, development and evaluation process.

Technical Integration

Successful integration of sensing, switching and power management within the manufacturing process is dependent on careful design specification. The merging of languages between garment designers, technology developers and the manufacturers has resulted in a more sophisticated approach to visualising the detail of technology integration than is commonplace in the outdoor apparel industry. Through ongoing cross-disciplinary engagement this project is closing the gap between design and technology.


Images: Lewis, Price, Smith, McCann.
WEARABLE FUTURES:
INCLUSIVE DESIGN
MARCH 2012 CONFERENCE

The one day conference, with an evening reception the night before, will take place in the Wellcome Trust building in Euston.

» Arrival and evening reception » Monday 26th March 2012
» Conference » Tuesday 27th March 2012

This event will bring together academic, industry and user group communities engaged in the hybrid area of Smart Clothes and Wearable Technology, building on the success of the Wearable Futures Conference, held at the university in 2005.

In particular this conference will promote a design-led approach to addressing a significant gap that has been identified in the area of design of contemporary clothing and textiles that may enhance the autonomy, independence, and sense of enjoyment and wellbeing of the Active Ageing.

Findings from current research in 'Design for Ageing Well' will stimulate discussion with regard to new strategies for new routes to a rapidly growing market, with end users at the centre of all discussions.

The conference welcomes industry involvement at keynote and delegate level, providing excellent opportunity for development of future collaborative research and knowledge transfer opportunities.

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