Evaluation of Knit Technologies for Bridal Wear

Karis R. Foster, Andre West, & Cynthia Istook, NC State University, Raleigh, NC USA

Keywords: knitwear, WholeGarment®, bridal wear, fully fashioned

Introduction: Businesses venturing into the knitwear industry have a few options for creating bridal wear. The most innovative of these options is through the utilization of complete garment knitting. Knitting in this way has the potential to reduce production costs up to 40% as compared to normal cut & sew production (Madhumathi, Janani, Ramakrishnan, & Sankaran , 2012). Complete garment products are knit without seams and provide a higher level of comfort to the wearer. This technology also has the capability to produce garments perfected for fit. Currently many high-end knitwear companies employ the use of fully-fashioned machines to knit products. Through this method, shaped pattern pieces are knit to size and later joined by linking or seaming. Complete garment knitting allows for most of the manufacturing process to be completed on a machine. Fully-fashioned knitting differs by requiring a labor force to join the shaped pieces together (Madhumathi et al, 2012). These two options pose a decision crossroads for business owners. To date, no research has investigated a concrete distinction between these two methods for a practical application. A decision making process was examined along with development of a model for business owners to use to weigh variables that will affect this type of capital investment. In order to test the validity of the model developed, a practical application was related to each technology and comparisons between the two were studied.

Literature Review: Within the knitwear industry, there are four main categories of knitting methods: cut & sew, knitted length or panel knitting, fully-fashioned and integral knitting. A major downside to the cut & sew method is that it is subject to large amounts of wasted material. As the pattern pieces are cut from a length of fabric, the leftover fabric is normally discarded which is a financial loss as well as an environmental concern. An additional negative is that the cut & sew, panel knitting or fully-fashioned methods have a significant requirement for human labor. The products created are subject to human error, which reduces the consistency of a collection of products. (Isaacs, 2005)

WholeGarment® or complete garment knitting provides a solution to these inconsistencies by manufacturing an entire garment ready-to-wear on the machine without seams. This process requires minimal processing after knitting and has the potential for reducing production lead times (Kanakaraj & Ramachandran, 2010; Tait, 2008).

Purpose: The intent of this research was to provide a sufficient framework for business decisions in knitwear companies when purchasing knitting technology. As knitting machines are a large capital investment, it is important for business owners to understand the benefits and disadvantages to upgrading technology. In order for a business owner to decide which type of technology to invest in, they must understand all options before them. Though complete garment

knitting is fairly new to the market, there are several advantages to using this technology compared to fully-fashioned production.

Methodology: This research examined a business decision making model developed by the researchers (Figure 1) using a bridal gown application on both types of technology. Very few bridal companies have ventured into using knitwear as an alternative to wedding apparel so this application provided an innovative option to the bridal market, which has the potential of reaching a bride with different preferences. This application also provided insight to a niche market within the knitwear industry. A bridal gown was developed using a Shima Seiki fully-fashioned knitting machine and an integral knitting machine. Information regarding design time, raw material utilization, technical issues (such as skipped or dropped stitches), speed of production, manpower required, etc. was kept in order to make accurate comparison between the technologies. Both dresses were evaluated by a few of the variables outlined in the process-decision making model within the stated methodology.

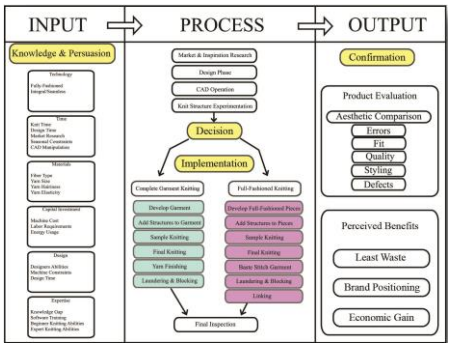

Figure 1. Knit Technology Decision Process Model.

Results: Garments were successfully created using both technologies (see Figure 2 for an example) although there was significant trial and error to correct problems with dropped stitches, yarn choice for the stitch type and needle gauge, and silhouette of the garment to fit within the parameters of the machines being used. The creation of bridalwear allowed the limits of the technology to be tested in unique ways (creating lacey effects, refined fit, wide sweeping skirts, etc.). Though there are many advantages for companies to consider using integral knitting technologies, many companies are resistant to change. The large capital investment that is required to purchase an integral knitting machine may outweigh these benefits. Since many countries are able to supply low-wage workers for the apparel industry, manufacturers may not see the true benefits to eliminating their use of labor until the price of labor increases significantly. These technologies may not be the most desirable for mass market production due to the equipment costs and learning curve, but definitely have application to niche markets that are interested in unique product and higher quality levels.

Figure 2. Example knit garment.

References:

Madhumathi, G., Janani, G., Ramakrishnan, G., & Sankaran, V. (2012). Technology & applications of seamless garment. *Indian Textile Journal*, *122*(7), 69–73.

Isaacs, M. (2005). seamless: eliminating stitches--more than a buzzword. *AATCC Review*, *5*(11), 16–19.

Kanakaraj, P., & Ramachandran, R. (2010). Seamless garment: Needle selection techniques and applications. *Pakistan Textile Journal*, *59*(1), 44–46.

Tait, N. (2008). All in One Piece. *Fashion Business International*, 42–45.