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Digital Transformation of the Silk Industry of Assam

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ABSTRACT

The case study on the silk industry of Assam gives an overview of the industry, background, production process and highlights the key issues, which the industry is currently facing. In order to ensure strategic success, the traditional silk industry will have to effectively cope up with the digitalization challenge in the market for customer discovery. The raw material is locally available but limited in supply and there is no alternative source to cater the needs of the weavers. Therefore, the weavers are bound to pay high prices of raw materials. Though the cost of raw material is increasing, the weavers cannot increase the price of the products due to availability of cheap synthetic silk in the market and, they are compelled to compromise with the profit margin of the product. The entire silk industry of Assam is passing through a stagnation period not only because of the financial crisis but also due to rising prices and dearth of raw materials. This has resulted in aggravating the losses of the silk industry, as the weavers have to sell the products at the older price while procuring the raw material at the newly fixed price. The existing silk industry of Assam should go for complete digitalization through interconnected ecosystem, disrupt, and reshape the existing industry by identifying the technology associated with the business process and aligning with the business strategy. A digital culture needs to be fostered in the entire industry.

CASE LEARNING OBJECTIVE

- Analyze the key problems faced by the silk industry of Assam
- Demonstrate the ability to digitalize the silk industry and make suitable recommendations.
- Identify the risks associated with industry and conduct a GAP analysis for efficiency, diversification and expansion
- Analyze the market environment in terms of suppliers, customers and competitors to gain competitive advantage
- What are the drivers of the digital revolution and the requirements of a digital customer?

INTRODUCTION

The silk industry of the state of Assam, which is situated in the north east of India, is well known for its quality and originality. Muga silk popularly referred to as the 'King of Silks' is traditionally produced in the Brahmaputra Valley of Assam where handloom weaving forms a cultural constituent of the women. Nearly 90% of the silk produced in Sualkuchi is from the mulberry sector only. Assamese silk reflects the cultural object of Assam, its tradition and unique identity and are available in three attractive varieties namely **Eri, Muga and Pat.** Muga is a wild golden silk geographically tagged to Assam. The state has emerged as one of the leading producers of

silk in the country with the climate of Assam being favorable for growth of Mulberry throughout the year. A research by the Department of Industries and Commerce of Assam shows that only Sualkuchi weavers' village is home to over 25,000 looms, which produces nearly 6 million meters of Assamese silk annually.

Eri Silk Fabric:



Source: https://www.tfod.in/art-design-articles/2282/eri-silk-with-khneng-embroidery-a-story-from-meghalaya

Muga Silk Fabric



Source: https://www.utsavpedia.com/textiles/muga-silk-the-golden-silk/

Pat Silk Fabric



INDUSTRY BACKGROUND

Majority of the mulberry silk processing takes place in Sualkuchi of Assam, which is an ancient cottage industry, to the extent that this place is appealingly known as the 'Manchester of the East'. The major occupation of the people living in this village is weaving and known as a land where dreams are woven in gold. The techniques of weaving are handed down across generations. These are small and family businesses operating in traditional industries in Assam

Digital Disruption

In today's business environment, industries are undergoing rapid changes, as one of the fundamental drivers of such change is digital transformation. Traditional business models are

re-examined and re designed as technological advances enable organizations to face challenges. Digitalization has increased the market capitalization of many businesses and have a profound impact on their industries. The silk industry of Assam which has been facing challenges due to lack of product diversification; technology, scarcity of raw materials, outdated tools and dearth of capital the industry calls for disruptive technology which can fundamentally change and disrupt the existing business model.

Supply of raw materials

The raw material is locally available but limited in supply and there is no alternative source to cater the needs of the weavers. Sualkuchi, the unique textile hub in Assam does not produce any raw silk. The traders in the locality procure Muga silk cocoons produced in several parts of Assam and its neighboring states. Therefore, the weavers are bound to pay high prices of raw materials like silk yarns and cocoons. Silk production has suffered a setback, according to the farmers, largely because of pollution from the brick kilns in the surrounding areas and doubled by use of pesticides. However, the oil companies have been burning up flare gases emitting from oil wells. Silkworm cannot survive in these areas as gas burning pollutes the air affecting the air humidity and temperature required for silk cultivation in the area. So many silk growers had to give up their occupation in different districts of Assam. Though the cost of raw material is increasing, the weavers cannot increase the price of the products due to availability of cheap synthetic silk in the market and, they are compelled to compromise with the profit margin of the product. The entire silk industry of Assam is passing through a stagnation period not only because of the financial crisis but also due to rising prices and dearth of raw materials. This has resulted in aggravating the losses of the silk industry, as the weavers have to sell the products at the older price while procuring the raw material at the newly fixed price. Users of internet have digital experience through apps and services are being personalized. With digitalization of business and intelligent enterprise, data of raw material supplier based across the state can be used in a smart way to become more innovative and achieve higher degrees of operating efficiency. Developments such as cloud computing and mobile technology will offer potential for innovation in terms of raw material delivery. By exploiting smart technology, the farmers involved in silk cultivation may be able to understand the temperature of different parts of the locality of the silk growing areas. Big Data Analysis can predict weather conditions and allow the farmers to decide the optimal times for raising and cultivating the raw material and maximize its yield and reduce wastage. This can be used to enhance the productivity of raw material. Digital technology can create infrastructure; database and create sharing culture to go green and save environment for protection; sustenance, revival and growth of the silk industry of Assam.

SWOT ANALYSIS

Strengths:	***Weaknesses:***
Raw Material- The climate is favorable for growth of Mulberry throughout the year.	**Modern Technology** -The use of modern technology in the weaving industry of Sualkuchi is far from being satisfactory.
Research- The Sericulture Training Institute and the sericulture research station of Assam are the two institutions, which are imparting training, and undertaking research works on sericulture in the State.	**Ignorance and Conservative attitude** - Ignorance, illiteracy and conservative attitude of the people connected with these industries are standing in the way of modernization and expansion of the weaving industry
Conducive Environment - Abundance of food plants, favourable agro-climatic condition, presence of large network of development agencies for supporting, and recognition of Geographical Indication (GI) to Muga silk of Assam	**Outdated Tools**- Due to ignorance, these industries are using outdated tools and old methods of production.
Marketing -The North East Handloom and Handicrafts Development Corporation (NEHHDC) has been playing an important role in the promotion and growth of handloom & handicrafts industry of Assam and other North- eastern state.	**Dearth of Capital**- Dearth of capital is a major problem faced by most of the weavers. They depend on village money lenders to meet their financial needs.
Training of weavers -A fashion design institute has been set up in Sualkuchi to train weavers in the modern techniques of silk designing and weaving.	**Lack of product diversification**- It has become inevitable to motivate the conservative entrepreneurs of the Sualkuchi silk cluster to innovate new products and emphasize on product diversification.
Quality and Durability of Products- So far, the quality of muga products is concerned it has ample strength and durability.	**Scarcity of raw materials** - As the weavers are facing the difficulty of getting regular supply of raw materials at a reasonable price, this retards the growth and expansion of these industries.
Competition- Muga, the golden yellow silk produced by the Antheraea assama is found onlyin the Brahmaputra Valley of India	**Lack of proper marketing facility -** Due to the absence of proper marketing arrangements these industries sometimes go for distress sell of their products to the private dealers at a poor price.
Brand Consciousness -To protect the purity of the silk, the Central Silk Board under the Ministry of Textiles has introduced the Silk Mark for pure silk products, since 2005 separately for Eri and Muga weaving products.	***Threats:***
Opportunities:	**Erratic Power Supply** - Due to shortage of electricity, many industries like handloom and textile industry in Assam are now facing premature closure.
Training – The Sualkuchi Institute of Fashion Technology (SIFT) is providing a platform for fashion and design education and research & training of weavers.	**Limited raw material** - Muga Seed Development Project has failed to supply the required quantity of yarn to the weavers.
	Recurring Losses - The industry is incurring losses due to non-availability of required quantity of yarn to the weavers in time.

Promotion of Self-help – Each Self-help group have been provided with INR 200,000/- (app $ 2,700) as subsidy and INR 200,000/- (app $ 2,700) as bank loan. 300 weavers were given training on modern efficient looming methods, new design and other related weaving aspects	**Cut throat competition** -Sericulture in India has taken a severe beating with cheap synthetic silk from China flooding the Indian markets. **Modern Weaving Techniques** –The produce of the Sualkuchi town, depends on age-old and traditional methods of weaving. **Environmental Pollution**: Negligent waste disposal mechanism and vagaries of weather threaten to disturb the fine balance of the ecological mantle and industrial well-being of the region. **Shift in crop plantation** - A large number of traditional silk growers have shifted from Muga food plantation to other commercial cash crops including tea and rubber. **Adulteration** -The golden Muga silk, despite being the pride of Assam is adulterated largely due to high demand and shortage of sufficient silk yarn. **Low Wages and Poor Living Conditions** - The low wages and poor living conditions discourage weavers from staying in Sualkuchi; more than 25 per cent of the looms remain unproductive throughout the year.

Production Process

Rearing of silkworms is a laborious and lengthy process and requires great skill and patience. Two methods of reeling are prevalent i.e. the traditional, which involves manual processing and the modernized method that employs a fast operating machine with the operator using both hands for reeling. Half of the silk in each cocoon is considered reliable and the remaining is used as silk waste and transformed into spun silk. After reeling, the muga threads are dried in the shade for three-four days, following which they are ready for use. The conversion of raw material into intermediate products requires time and processing skills. Moving towards digitization all information related to the industry and its environment can be stored electronically. Digitalization will call for digital talent and there is a global skill shortage in this area to cope up with the increasing demand. Incentives should be given to current weavers following the traditional methods of production to use online networks.

Even small firms and local entrepreneurs can get access to technology for raw material procurement without significant financial investment. As customer demands are evolving at a rapid pace; instead of designing a single product that can be marketed to many customers; there should be a shift in the mindset to designing many experiences for one customer. This will enhance the ability to constantly learn and adapt as customer needs change. The existing

industry should be able to take products to a new level through innovation and developing prototypes and monitor the reactions in the market.

With the development of mechanized system, at present more than 75% of the households are following commercial weaving of handloom. With the use of big data the indigenous silk producers can identify raw material waste and inefficiency and add improvements to working procedures in order to gain market advantage. The only problem the industry can face is to convert the existing data on suppliers and customers into useful information to satisfy information needs.

3D printers can be used to build prototypes instead of undergoing the entire production process to create samples. Dearth of raw material being a major problem, use of 3D printers can reduce wastage in the production process that results from traditional manufacturing process. This can also eliminate transport costs from sourcing material from the supplier to the weaver with lesser environmental impact. 3D Printers will reduce lead times in the production process and decrease the requirement from holding inventory, resulting in reduced investment in working capital. There are greater chances of product customization with digitization of business as it can add in identifying clusters of customers exhibiting similar buying patterns within the range of products offered. If the products can be made in house rather than sourcing from a supplier, the individual weavers will not have to pay an element of overall profit to that supplier to give them a return.

However there are few limitations associated with the 3D Printer like cost of 3D printers can be high; there may be concerns in terms of quality; strength durability and reliability of the product and use of 3D printing requires specific expertise. However though 3D printing can solve the issues associated with traditional manufacturing process, high energy consumption requires special electrical installation

Finance

Constraint in procuring funds is a major problem faced by most of the weavers and have to depend on village moneylenders for securing finance. The weavers in order to enhance their financial credibility must keep their 4Cs [Capacity of Business, Capital, Credit and Collateral available] in business intact as they do not have access to alternative sources of fund. The weavers must aim at economic efficiency; mitigate wastage; balance between benefit and loss, as availability of regular supply of raw material is a major concern of the industry. To solve the problem of paucity of funds the category of people the weavers meet like customers, suppliers, competitors or even intermediaries can become angel investors. If the silk industry needs to attract investment from outside sources it must go for digital transformation as organizations with high digital tractions are linked to high company valuation.

ANALYSIS OF MARKET AND COMPETITORS

In a competitive environment there has to be greater interaction between customers and manufacturers. In order to produce goods tailored to customer requirements and provide faster deliveries, the enterprise must be linked to both suppliers and customers.

Actions are required for revival, growth and expansion of the Silk Industry in Sualkuchi through digital transformation, leadership in digital strategy and its governance in the strategy

formulation. The industry requires conversion into a digital enterprise for business continuity planning in order to recover from potential threats to the industry. Disruption in raw material supply is a major threat to the business so it calls for supply chain transformation local and regional versus global. Otherwise, collaboration with competitors in the form of economic integration to share resources and customer base, safeguard supply chain and ensure that raw materials and products are resilient to digital disruptions as uncertainty is the new normal. A way to implement a simple marketing plan that focuses on very small markets, down to the level of the individual by value addition to business through wide networks, sales channels and customers and integrating customer experience and expectations. The digitization will be an exercise in change management and the those in the ecosystem of the silk industry of Assam will need to energize the workforce and inspire confidence that digitization is the right way forward if carried out in an appropriate manner. The digital transformation will represent a considerable investment but small and medium sized industries involved will be able to quantify their return on investment for their digital initiative.

With ecommerce platforms and disintermediation, the products can be marketed at global level because of rising living standards in developing economies, which means that more and more people are gaining access to the internet and so increased connectivity. The silk industry should provide seamless experience, great service and transparency with the ability to learn and adapt to customer change based on resources and core competence with increased awareness of business environment. Digital enterprises must be prepared for increasing level of customer empowerment; rapid development in digital technology and increasing level of automation in the industry.

Redesign of Business Process- Growing demand and dearth of raw material, longer production cycle and lead time calls for end to end Supply Chain Management to optimize the overall Demand and Supply Data. Limited application of technology and inadequate information system cannot eliminate common problems encountered by majority of the weavers like material shortages, productivity enhancements, customer service, cash management, inventory problems, prompt delivery and response to change in business operations and market conditions.

The present state of the silk industry in Sualkuchi encompassing unorganized entrepreneurs and weavers calls for radical redesign and transformation of the business process to achieve improvement in critical and contemporary measures of performance like cost control of raw materials, improvement in quality, service and speed, enhancing productivity and production process of the intermediate products. At present half of the silk in each cocoon is considered reliable and the remainder, used as silk waste. Therefore, reliability of silk content in each cocoon should be increased through research and application of technology, which will increase the supply of silk products. The weavers need to interact with customers, supplier, competitors and distributors and reduce the business process cycle time.

Competitive Intelligence - The tool of Competitive Intelligence should be used to alert the silk weavers of Sualkuchi about the threats and opportunities of the weaving industry. Mostly in terms of availability of raw materials, application of modernized tools, training and enhancing productivity of weavers, stiff competition due to liberalization of silk trade in the recent years, product diversification and marketability of the products. The weavers should discover the

needs of customers and satisfy them by a technological development in competitive environment and product diversification. In view of removal of quota system on export and import of handloom products under multi-fiber arrangement of the World Trade organization, prospects of exporting silk fabrics and garments have brightened. This prospect calls for product diversification from traditional mekhala chadar to weaving bedcovers, bed sheets, curtains, sofa covers and garments like sarees, skirts, etc.

Based on the threats and weakness of the weaving industry, in a competitive environment both from local and international market the weavers should be customer driven. It is necessary to review and assess various business functions, which add utility to the silk, and muga products. It is necessary to integrate and coordinate the efforts of all business functions specially rearing of silkworms and enhancing the reliability of silk, increased cultivation of som and suala plants supplying raw material and create pollution free environment for Muga and Mulberry worms which are more sensitive to temperature and humidity.

At a time when the industry can rest on its laurels and take comfort, environmental pollution emanating from the neighboring areas is likely to affect the fate of the continuance of sericulture industry in the area. On investigation it was found that toxic fumes from the burning of urban waste has obstructed the growth of the silkworms and the Som plants. The problem faced by the Muga sericulture trade is largely an ecological menace. Radical design through information technology with business process reengineering, the indigenous weavers can gradually aim at optimizing the business process to achieve organizational objectives and manage risk and vastly improve effectiveness and efficiency. Blockchain technology and use of cryptocurrencies can eliminate the role of intermediaries and decentralize trust attaching it more to the weavers and the sellers at various marketplaces. With blockchain as products change hands across a supply chain from manufacture to sale, the transactions can be documented in a permanent decentralized record- reducing time delays, added costs and human errors.

Blockchain technology will prove the authenticity and origin of physical products creating an auditable record of the journey behind all physical products. Currently consumers' trust in the retail system is placed in the marketplace where their purchases are being made but embedding block chain technology will shift the trust to the weavers. Investments in customer loyalty programs, customer data and technologies making the shopping experience easier, safer and more efficient will be needed going forward. The key reason for the growth of new disruptive businesses is from technology as it reduces costs; improve efficiency and increase access to customers. The silk industry of Assam should be transformed into an Intelligent Enterprise; using data in a smart way for data led decision-making, become more innovative and achieve high degree of operating efficiency.

Looking ahead regarding the future of silk industry of Assam, the Millenials should be the main target to embrace the digital strategy. Small and medium sized industries involved in silk production should empower the workforce with right digital skills; create policies that support collaboration and knowledge sharing tools and build work space that attract digital talent.

Teaching Notes

Case Study Summary

The case study on the silk industry of Assam gives an overview of the industry, historical background, production process and highlights the key issues, which the industry is currently facing. The case mentions that due to lack of product diversification; technology, scarcity of raw materials, outdated tools and dearth of capital the industry has been facing challenges to cope up with the digitalization strategy in the market for customer discovery. The weavers must aim for organic growth of the business through product diversification; undergo training to imbibe the latest trends and technology in the modern silk industry, adopt modern weaving techniques and go for product diversification. The case demonstrates examples how Government has taken initiative to address various issues currently facing the industry in terms of raw material procurement, training of weavers, revival, expansion and diversification of sericulture in the state. The existing silk industry of Assam should go for complete digitalization through interconnected ecosystem, disrupt, and reshape the existing industry by identifying the technology associated with the business process and aligning with the business strategy.

Teaching Objectives

The main objective of the case is to demonstrate how technology and innovation through digital transformation can revive the silk industry of Assam. The industry requires conversion into a digital enterprise for business continuity planning in order to recover from potential threats to the industry. Disruption in raw material supply is a major threat to the business so it calls for supply chain transformation local and regional versus global. The case is a great example how growing quality of life and constant changes in the field of science and technology requires a fully integrated business covering functional areas like Logistics, Production, Finance Accounting and Human Resources. In a competitive environment there has to be greater interaction between customers and manufacturers. In order to produce goods tailored to customer requirements and provide faster deliveries, the enterprise must be linked to both suppliers and customers. Controlled market network has pushed the weavers into the grip of both intermediaries and outside businesspersons who control the entire raw silk yarn market. Weavers and small traders are now forced to procure raw silk yarn at the price fixed by the intermediaries and have no say in the pricing.

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