Smart manufacturing & 4IR in textiles

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Introduction

Textile Industry

Industrial Revolution

Industry 4.0 in textiles

LMW’s Contribution
About LMW

Founded in 1962, with Headquarters in Coimbatore – India
60+ years of legacy & leadership with 75% market share in India
1 in 3 manufacturers across the globe to provide end-to-end solution for Spinning technology
3 manufacturing locations across the globe
Supplied 50 million spindles across 16 countries
Indian Textile Industry

- 2nd largest in the Globe
- 100M Employment (45M direct), 2nd largest next to Agriculture
- 4% Contribution to the country’s GDP
- 13% of industrial production
- 12% of export from India
- 4% Global trade
Industry Revolution – Overview

1.0 Mechanisation
2.0 Electrification
3.0 Automation
4.0 Digitization
5.0 Personalization

Today
1780
1870
1970

Tomorrow

Big Data
Augmented Reality
Cloud Computing
Cyber Security

Artificial Intelligence
Autonomous Robots
System Integration
IoT

Big Data
Augmented Reality
Cloud Computing
Cyber Security

Industry 4.0

AI
Autonomous Robots
System Integration
IoT
Industry 4.0 in Textiles – Need

**Manpower shortage**
- Shortage of manpower
- not a preferred industry for the current generation

**Cost of Production**
- Skilled manpower is costly affair
- 60% cost of yarn is from raw material (Yarn realization)

**Improved Quality & efficiency**
- Consistency in outputs
- Advanced data analytics

**Varieties in Raw material**
- Huge varieties & variations
- Manual bale management difficult
- AI enabled decision making
Industry 4.0 in Textiles – Need

- Manpower deployment in Spinning mills

- Production & Maintenance contribute around 80% of manpower
- Scope for handling shortage through
  - Automations
  - Increase MTBA
  - Reduce maintenance

BR – Blow Room; CW – Cone Winder; DF – Draw Frame; MTBA – Mean Time Between Assist; RF – Ring Frame; SF – Speed Frame
Industry 4.0 in Textiles - Solution

- Automations
  - Ring frame auto piecing
  - Roving Transportation
  - Lap Transport system
  - Can transport system
  - Yarn Break Sensor
  - Roving Stop Motion

Automated Transportation

Ring Frame ‘As Human Piecing’
Industry 4.0 in Textiles – Need

- Complexity in Data handling

Manual handling of Big data is difficult

Necessity of AI to manipulate the data & provide Decisions or Suggestions
Industry 4.0 in Textiles - Solution

- Bale Management System

Conventional Process

- Manual Data interpretation
  - Fibre Data
    - Length & Strength
    - Micronaire
    - Colour grade

Bale Management System

- AI Data analytics

Result: Consistency in yarn quality; Control over cost
Spin Connect

Experience the power of IIoT with Spin Connect - the ultimate web-based monitoring and control companion
Spin Connect

Spin Connect

Information Board  Web Based
Health Monitor  Read Write
Climate Monitor  Reports & Charts
Remote Diagnosis  E-Alert
Mobile App

Output tracking & Management (Yarn inventory control)
Ecosystem (Power Air, Humidification)
Machine Performance, Quality
Bale Management
Input to Output
Spin Connect

- PLC: Production Module
- Energy I/O: Energy Module
- Sensor: Condition Monitoring Module
- HVI: Bale Management
- YBS / RSM: Module
- Maintenance: Module
- Fancy Yarn: Pattern Generation
- Online Quality: Module
- PLC: System
- PCB: System
- Data: Analytics
- Decision / Suggestion
Spin Connect

- AI-Driven Data Analysis

DATA

- Production
- Uptime
- Quality
- Machine Parameter
- Air
- Energy

DATA ANALYTICS

- Data-Driven Decision Making
- Machine OEM Performance
- Predictive Maintenance
- Resource Conservation
- Customization
Spin Connect

Machine Performance

Birds eye view

Cluster performance
LMW Contribution

- Smart Series Machines for Smart Manufacturing

- Automate regular function (Replace Human)

- Automatic Adjustment (for Quality & Productivity)
  - Data
  - Sensors
  - Actuators
LMW Contribution

- Entire range of Smart machines from Blow Room to Link winder compatible with Spin Connect / Industry 4.0
THANK YOU