



COTTONING ON: adopting Web3 technology for cotton value chain transparency.

Dr Hilde Heim h.heim@mmu.ac.uk

Transparency is increasingly essential for cotton value chain compliance. Supply chain stakeholders must undertake the task of identifying and tracing an intricate network of raw fibre producers and manufacturers to avoid greenwashing, effectively communicate product information to consumers, adhere to labelling criteria, and conform to stringent regulations.

Web3 technologies aim to enhance textile supply chain transparency by leveraging tracking and tracing devices, and deploying AI and blockchain systems architecture. To date around **80 digital solutions** have appeared on the market offering improved transparency.

DATA	CHALLENGES	MATERIALS	SUPPLIER	PRODUCT	STRATEGIES
COLLECTION	Digital transformation,	Raw fibre origins; cultivation practices; water usage; data privacy; environmental impact;	Supplier identity; reputation; reliability; operations; fair work; social conditions; environmental impact;	Authenticity; quality; standards; certifications; tokenisation; verification;	SMEs; Vision and values; Internal and external Digital transformation; Regulatory compliance
STORAGE	Regulatory compliance,	processes flows and logistics; source identity.	fair compensation; processes flows and logistics; direct trade; smart contracts; transparent pricing and negotiation; cross-border automated payments; terms and conditions of trade; delivery deadlines; accountability.	Operations; fair work; social conditions; environmental impact; processes flows and logistics; circularity; regeneration; end of life.	
SHARING	Consumer demand.				



over 130 data points!



Web3 implementation along the cotton value chain would require collaboration among various stakeholders, including cotton farmers, suppliers, agents, manufacturers, technology providers, and regulatory bodies. The goal is to facilitate a more

transparent, ethical, and compliant cotton value chain that benefits both producers and consumers.

2 However, the number and types of solutions

available poses a challenge for supply chain stakeholders. Which application/s to use, how to access them, the return on investment, and to what end, has given rise to difficult decisions.

3 This study investigates the most successful solutions and analyses their functions, and ease of implementation for the cotton value chain. It presents live use cases utilising data sourced from company websites, media, government organisations, experts and importantly user interviews, thus providing a succinct overview of the tools and technologies available, and their effectiveness. Additionally, it offers a framework for adoption that identifies Web3 tools' place in the value chain, aligning them with the appropriate process, organisation/s and product.

1 Web3 tools can intervene at several pivotal points, facilitating secure and transparent data sharing.



GENERAL

SOURCE

FOOTPRINT

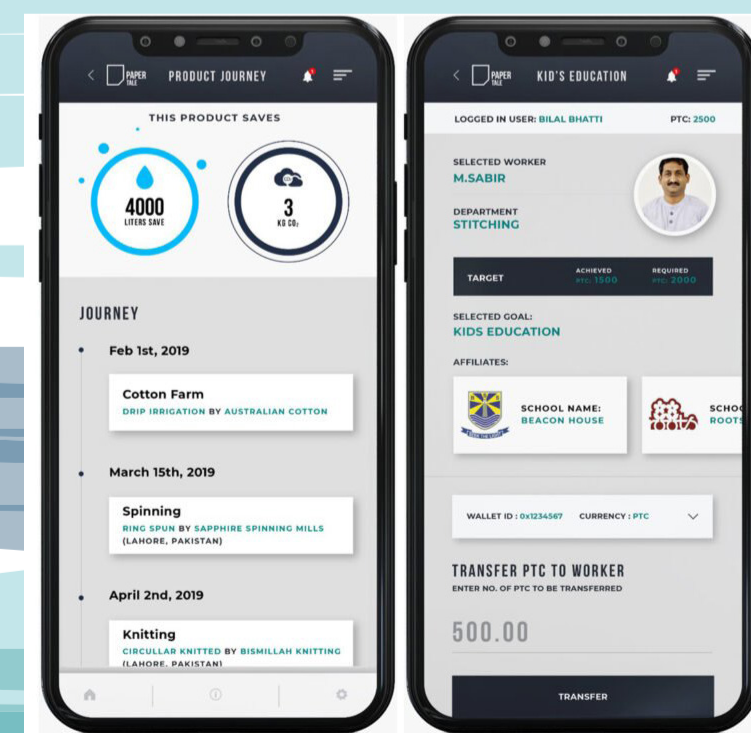
STEWARDSHIP

MAINTENANCE

80+ digital tracking and tracing solutions!

FIBRE PRODUCTION

GARMENT PRODUCTION



MANCHESTER FASHION INSTITUTE

visit our knowledge exchange website FASHTRAX to stay up to date with innovations in fashion supply chain transparency.

CONSUMER

FABRIC PRODUCTION

WATER RECOVERY

Source: Curra, K., J. Sheenani, and K. Nimmikivi. Transparency and traceability in the textile value