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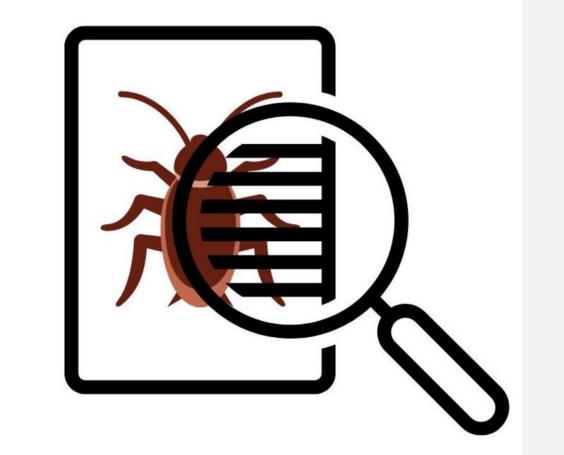
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Digital Product Passport for Global Insect Supply Chain

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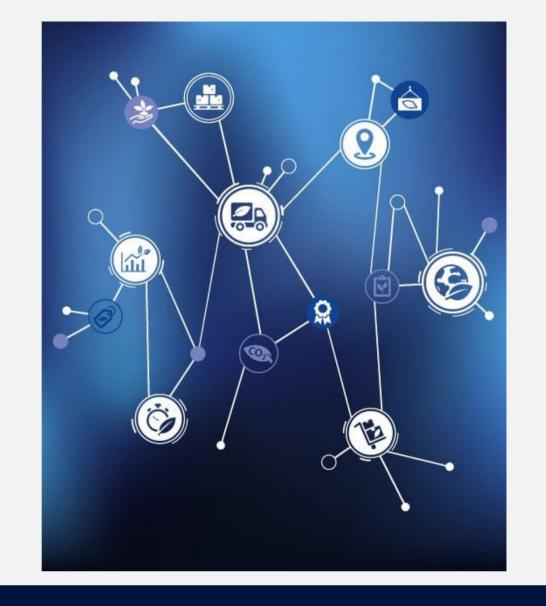
1| Transparency for Insect Supply Chain

- By 2050, the world population will overtake 9.7 billion people. Insects as an alternative animal feed is a key to solving the problem of increasing protein demand (Samir, K. C., & Lutz, W., 2017).
- The lack of information about the origin, quality and safety of insect products is a major obstacle to the growth of the market (Schlüter, Oliver, et al., 2017).



2 Potential to improve the transparency of the production process of insect protein

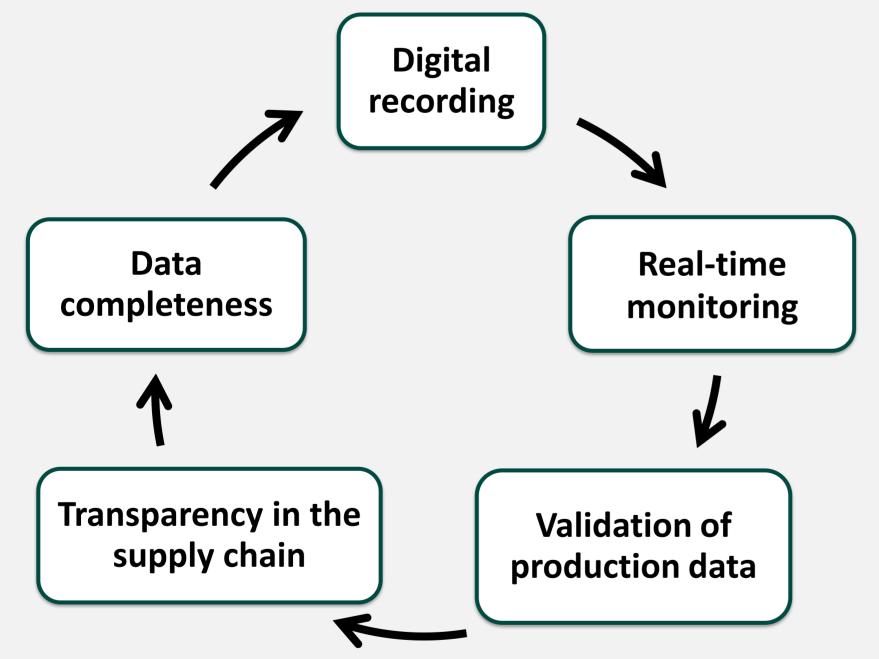
 The digital AI-supported and datadriven product passport makes it possible to trace the origin, feed composition and other quality aspects of insect products, which will increase the acceptance of insects



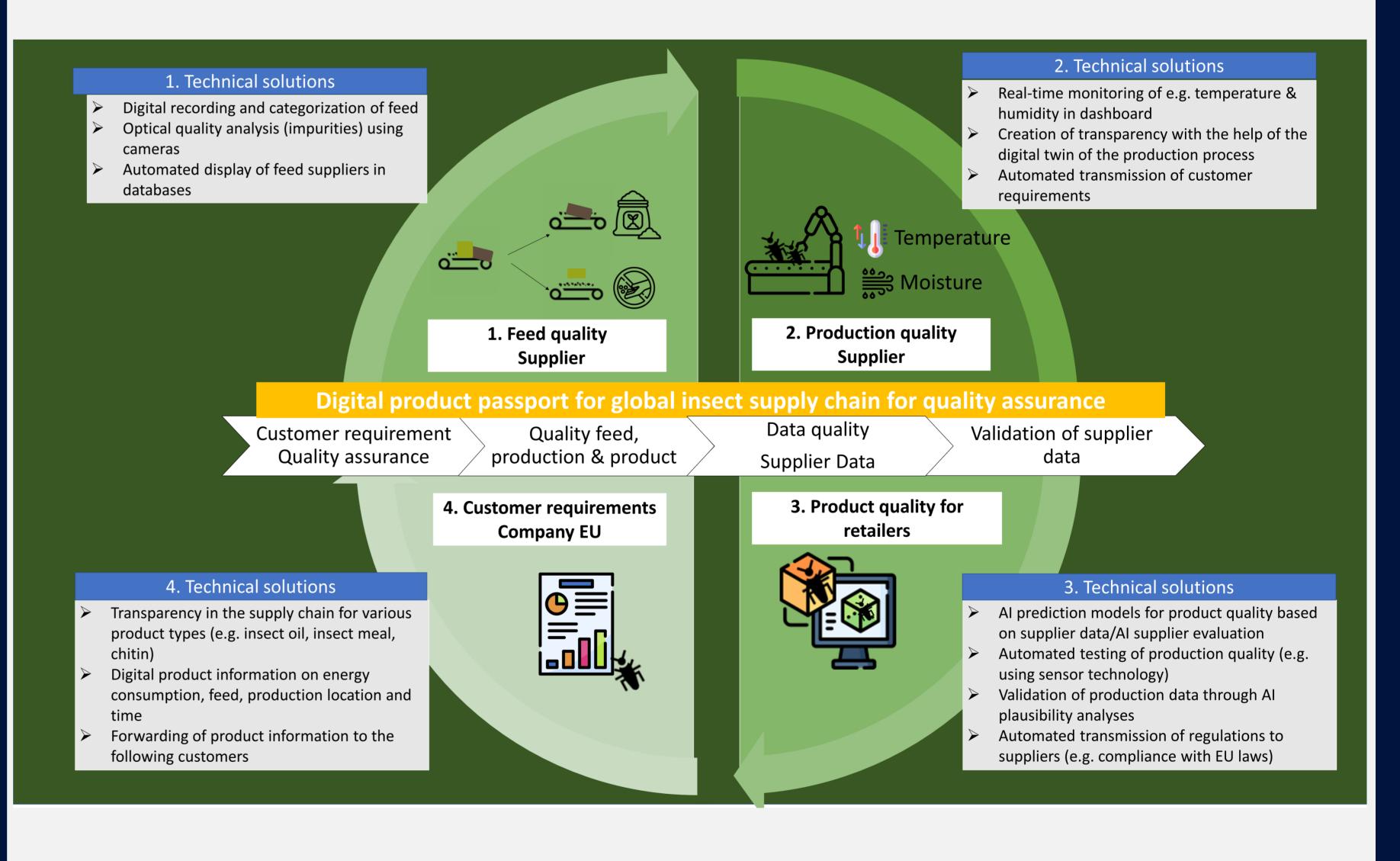
3 Product Passport as a problem solving approach enables:

4 Digital Passport Data Acquisition System

- transparency and accessibility of information
- continuous improvement measures to achieve the climate goals of a company
- a process-specific proof of the environmental footprint toward the actors of the circular economy
- an exact allocation of the process-dependent environmental impacts at product level
- applicability for service providers and companies without production lines (Alt et al. 2023)



Chain Management" p. 37



5 Blockchain Trends and derived Challenges in SCM and Supply Sustainability & CSR Supply-chain risk management Customisation Value creation networks Chain in Digital **Passport** 러물 (Cha 5 Purpose of the BC-Application ep OP Automated Evidence of Fraud and Open **Digitisation of** Compliance Traceability of the Marketplace Data Monitoring of the information origin counterfeit tracking / contracts values via blockchain flow of goods product status proofs detection Certificate Mgmt. access (Smart Contract) (tokenisation) Figure 1. «Blockchain and Supply Producer Producer signs Storage of Health & Information freely Order Tracking Real-time Automated data Payment System Demand and **Rearing Media** QR Code for products using the Safety Inspection accessible on the monitoring of validation Detailed Supply Chain in Digital Passport». **Production Date** private key Certificates on the Blockchain **Product Batches** product Auto-checking information on Supplier and ample Adapted from Holschbach and Buss Information on Product traceability Blockchain QR Code on the Real Time Camera environments required inputs for product origins Customer (2022),processing method products for Monitoring compliance with and movements Information across the entire using sensors supply chain searching info various countries' "Anwendungsmöglichkeiten und during logistics ш 5 e.g. humidity regulations. Limitationen der indicators õ Blockchain-Technologie im Supply

References:

- 1) K.C, Samir., & Lutz, W., 2017. The human core of the shared socioeconomic pathways: Population scenarios by age, sex and level of education for all countries to 2100. Global Environmental Change, 42, pp. 181 - 192.
- O. Schlüter et al. "Safety aspects of the production of foods and food ingredients from insects." Molecular Nutrition & Food Research, 61 (2017): &NA;
- 3) Alt, Shari, et al. "Status and Future of Real-Life Application of the Digital Process Passport in Germany." Circular Economy and Sustainability (2023): 1-12.
- 4) Holschbach, E., & Buss, E. (2022). Ausgestaltung von Blockchain-Anwendungen in Einkauf und Supply Chain Management. In Blockchain in Einkauf und Supply Chain: Technologie, Anwendungen und Potentiale in der Praxis (pp. 69-75). Wiesbaden: Springer Fachmedien Wiesbaden.