FROM PRODUCT TO MARKET: LESSONS LEARNED IN THE LIFE CYCLE OF A DIGITAL TRANSFORMATION PROJECT FOR AGRICULTURE

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INTRODUCTION AND BACKGROUND

Development Gateway, an IREX Venture (DG), [UN International Trade Center (ITC)](#), [Jengalab](#), and [TechChange](#) held an event titled "From Product to Market: Lessons Learned in the Lifecycle of Digital Agriculture Transformation" on the 17th & 18th of January 2024, to exchange lessons learned from approaches driving digital agriculture transformation in Francophone Africa.

Key learning goals for participants of the event were to:

a. Develop a "knowledge base" of products and projects, expanding knowledge of specific tools in West and Central Africa and how these innovations address the problems needed to reduce food insecurity and scale food production;
b. Strengthen the link between partners—innovators, regulators, development partners, and others—to boost investment in viable digital innovations;
c. Understand how policies and frameworks contribute to the success (and failure) of innovations that drive transformation
d. Concretise the concept of sustainability and interoperability of digital systems, creating a "blueprint" for how agriculture technology can more effectively scale transformation and increase impact.

Through a mix of panel discussions and hands-on workshops, the event highlighted a number of crucial lessons from the implementation of digital transformation projects for agriculture. Notably, three overarching lessons emerged as essential considerations prior to the launch of any digital solution:

1. The importance of an in-depth understanding of user needs
   Successful projects began with an in-depth assessment of farmers' specific needs, using methods such as quantitative studies, qualitative analyses, and on-the-spot diagnostics. It is essential to understand existing farming practices, literacy levels, skills, and user constraints in order to design appropriate solutions.

2. The need for adaptation to local realities
   Digital solutions must be adapted to local conditions, taking into account cultural, linguistic, and economic differences. The approach must be pragmatic, avoiding the imposition of complex technologies that may not be well understood or adopted by farmers.

3. Ensuring continuous innovation and co-creation
   Successful projects have demonstrated a capacity for continuous innovation, adjusting their offerings in line with feedback and the difficulties encountered in the field.

KEY TAKEAWAYS

The use of digital technology in agriculture offers significant benefits, such as crop management, weather data collection, and resource optimisation. However, challenges remain, such as unequal access to technologies and the need for appropriate training for farmers. The reality varies from region to region, but digital technology continues to play an increasing role in modernising the agricultural sector and achieving food sovereignty in developing countries.

The sessions tackled the above through traditional panel discussions and group work, providing participants with an in-depth perspective on the challenges and opportunities inherent in the digital transition of the agricultural space. They were structured in three distinct phases, tracing the "cycle of digital transformation" through the phases of design, construction, and scaling.

DESIGN: IDENTIFYING PROBLEMS AND CONCEPTUALISING PRODUCTS/PROJECTS

The design phase, explored in a two-part discussion, analysed the current agricultural landscape, highlighting the challenges and opportunities presented by digitisation.

The first part of the discussion focused on the obstacles to a favourable environment for digital agriculture. This panel brought together the various stakeholders (government, civil society and the private sector) who govern the agricultural ecosystem to discuss the challenges of digitising agriculture. They provided an in-depth overview of the policies and frameworks supporting agricultural digital transformation in Senegal and Benin.

Senegal's Plan Sénégal Emergent (PSE) Horizon 2035 positions agriculture as the driving force behind development, with a focus on food sovereignty. Through the Direction de l'Horticulture (DHORT), the government has set up sectors and permanent statistics (Horti-stats) to improve access to information and control of the horticultural sector.

As for the private sector, represented by Yoro Diaw, chairman of Suqali Mbay Mi Senegal, underscored the persistent challenges, in particular the complexity of the problems encountered and the need for a compelling correlation between research and practical needs.

Speaking on behalf of the Senegalese civil society, El Hadji Thierno Cisse, coordinator of the [Conseil National de Concertation et de Coopération des Ruraux](#) (CNCR's technical support unit), reiterated the

importance of promoting dialogue between technology designers and agricultural stakeholders in order to ensure that solutions are tailored to real needs. Cisse stressed the need for clear policies, the identification of producers and the creation of frameworks for family farms, as well as the adaptation of technologies to real needs on the ground, which is essential to guarantee effectiveness. CNCR plays a crucial role in defending the interests of farmers and promoting the local adoption of technologies.

In Benin, reforms have led to the creation of the [Agence des Systèmes d'Information et du Numérique](#) (ASIN) to promote the digitisation of the agricultural sector, with an ambitious project for the exhaustive collection of data. However, despite these efforts, there are still persistent "white zones" without Internet access, hampering the digitisation of agriculture. Standardisation of certifications and data cleansing are challenges that need to be overcome to ensure the success of the digital transformation.

In summary, the panel revealed the crucial importance of collaboration between the public and private sectors, as well as the need for pragmatic initiatives tailored to local realities to ensure the success of the agricultural digital transformation. Synergy between players, clear policies and the continuous adaptation of technologies to real needs emerged as key elements for progress in this transformation.

The second part of the discussion explored the strategic use of evaluation to stimulate technological innovation in the agricultural sector. Discussions focused on the needs assessment phase, the specific challenges encountered in designing technological solutions for agriculture, and recommendations for sustainable and appropriate implementation. Some of the best practices shared include:

- **Needs assessment**: It is important to focus on the real needs of users before implementing a project. The assessment in Ghana focused on understanding how users planned to use the solutions, thus establishing a link between their needs and the proposed solutions.
- **Technological ecosystem**: In the Central African Republic, the ecosystem assessment identified the crucial need to improve connectivity by, for example, setting up digital agencies, facilitating access to finance, and democratising mobile banking services.
- **Practical integration of assessments via an approach based on the needs of small-scale producers**: In Senegal, as part of Food and Agriculture Organization of the United Nation (FAO) projects, the results of assessments have been integrated based on the specific needs of farmers. Interactive platforms have been created to collect farmers' needs directly, but technical challenges have been encountered, particularly in terms of using smartphones.
- **Challenges facing tech entrepreneurs**:
  - **Educating farmers**: Tech entrepreneurs in Senegal face the challenge of educating farmers, who are often attached to traditional practices. It is essential to go out into the field, educate them, and develop offerings tailored to their needs and low purchasing power.
  - **Analysis of needs by National Agricultural Research Systems**: National agricultural research systems, coordinated by the West and Central African Council for Agricultural Research and Development (CORAF), highlight the need for multi-stakeholder collaboration. A digitised approach, from data collection to the design of solutions, is essential to meet the diverse needs of each stakeholder.

- **Improving the implementation of assessments**: For successful implementation, it is imperative to identify blocking factors from the outset. A common digital strategy, appropriate legislation and access to capacity building were cited as essential elements.

The speakers emphasised the importance of centralising data and sharing it between data-collection bodies to avoid "steering by sight." A multi-stakeholder system involving banks, the private sector, and research bodies is also needed.

In conclusion, the digitalisation of agriculture must be rooted in an in-depth understanding of the needs of users and the specific features of each ecosystem. Collaboration between the various players, education of farmers and adaptability of solutions are the keys to success for a sustainable and appropriate digital transformation.

The design phase in agricultural digital transformation requires a user-centred approach, ongoing education, adaptability to local realities, multi-stakeholder collaboration, and an in-depth understanding of each farming community's specific needs.

CONSTRUCTION: PRODUCT/PROJECT CONSTRUCTION, TESTING, FEEDBACK

Following an in-depth discussion of the design phase of the digital transformation lifecycle, the event shifted to the construction phase, providing participants with inspiring case studies, success stories, and practical advice on how digital solutions can be implemented in the agricultural context.

The panel on "Connecting Users' Needs and Capabilities" looked at how these needs and capabilities can be brought together to drive forward the digitalisation of agriculture and to enable users to integrate digital solutions in a sustainable way. We often see the introduction of solutions or programmes that offer digital solutions in response to certain specific needs that have been identified, but which do not necessarily take into account users' ability to integrate these solutions or actions.

A number of key points emerged from these discussions concerning the alignment of users' needs and capabilities for the digitalisation of the agricultural space:

- **Assessing and understanding needs**: It is important to carry out an in-depth assessment of the needs of agricultural users. This involves approaches such as quantitative studies, qualitative analyses, personal interviews, focus groups, and on-the-spot diagnostics.
- **Adaptability of solutions**: The solutions proposed must be adapted to the specific needs of farmers, taking into account their level of literacy, habits, existing skills, and constraints. It is crucial to co-design with users to understand what already exists and to encourage continuous improvement.
- **Contextualised training**: User training is a key stage that must be contextualised, practical, and accessible. The use of local experts, local languages, a variety of media (online and face-to-face), and an individualised approach is recommended.

- **Digital inclusion**: Local languages should be integrated into digital solutions. The use of artificial intelligence to translate into local languages, as well as take into account cultural and linguistic specificities, is an example of a potentially beneficial emerging practice.
- **Coordination and collaboration**: Coordination between the various stakeholders has been identified as a challenge. One of the recommendations is to set up consortia to promote synergy between players in the agricultural sector, NGOs, private companies, and public institutions.
- **Access to energy**: In addition to connectivity, energy is crucial to facilitate digital transformation activities, especially in regions where access may be limited.
- **Pragmatic approach**: Solutions should be simple and understandable and should meet farmers' needs. It is important not to impose complex technologies that could be misunderstood or poorly adopted.
- **Implementing public policies to enhance sector attractiveness**: This means addressing fundamental issues such as land and labour to create an environment conducive to the adoption of digital transformation.

The key to success in digitising the world of agriculture lies in a user-centred approach, a deep understanding of their needs, and the design of practical, tailored solutions that can be significantly integrated into their day-to-day farming practices.

The next panel focused on "What Works and Why" and gave entrepreneurs and organisations the floor to share their experiences, challenges, and innovative solutions in agricultural digitalisation within the West African context.

The challenges included:
- **The integration of cooperatives**: Several speakers highlighted the difficulties involved in integrating cooperatives into their projects, in particular the problems of administrative structuring and the challenges of getting them to sign up to digital initiatives.
- **Market access**: The challenge of market access was mentioned by several speakers, highlighting problems in marketing agricultural products, including obstacles linked to logistics, quality standards, and cumbersome administrative procedures.
- **Training and technological adoption**: Some speakers highlighted the difficulty of training and adopting technology, especially among farmers and women processors. This underscores the need for concerted efforts to increase awareness and provide education on utilising digital solutions.
- **Public sector support**: Some projects have encountered difficulties due to a lack of public sector support, underlining the need for closer collaboration with the authorities to help initiatives succeed.

Beyond the challenges, speakers also shared success factors, which included:

- **Co-creation and stakeholder involvement**: Projects that have involved local stakeholders, including cooperatives, in the design and testing process have been more successful, ensuring a better match with real needs.

- **The introduction of hybrid models**: Initiatives that have moved towards hybrid models, combining digital approaches with physical elements such as shops, have been more successful in solving the problems of market accessibility and adapting to consumer needs.
- **Focus on the farmer**: Projects that have placed farmers at the heart of their offering, involving them at every stage, have succeeded in creating more sustainable solutions that are adapted to the realities on the ground.
- **Collaboration and partnerships**: Collaboration with organisations, NGOs, and government institutions has been a key success factor, enabling organisations to broaden the impact of their initiatives and obtain crucial support.
- **Adaptability and feedback**: Projects that have demonstrated a capacity to adapt to feedback and difficulties encountered have been able to adjust their offerings to better meet the changing needs of the agricultural sector.
- **Awareness-raising and education**: Initiatives that have succeeded in raising awareness and educating stakeholders, both farmers and consumers, have been able to overcome the challenges associated with technological adoption and understanding the benefits of digital solutions.

In summary, successful agricultural digitalisation in West Africa relies on an inclusive, user-centred approach, with close collaboration and diverse approaches. Challenges remain, but innovative projects have demonstrated that positive transformation is possible with coordinated efforts and a commitment to social and economic impact.

A successful construction phase in agricultural digitisation requires a holistic approach, from a thorough understanding of needs to continuous innovation, while encouraging collaboration and direct involvement of end users.

SCALING UP: TRANSFORMATION INTO INTERCONNECTED SYSTEMS AND THE ROLE OF DIGITAL FARMING POLICIES

The final phase of the event, scaling up, offered a perspective on the ongoing optimisation and sustainability of digital transformation. Participants explored ways of optimising agricultural processes through technology while emphasising the importance of maintaining an interconnected, sustainable, and ethical approach. The dynamic interaction provided an opportunity to share experiences, inspire, and discuss the long-term implications of digitalisation in agriculture.

This scaling-up was analysed from the perspective of financially sustainable technology. The panel discussed creative approaches to financially sustainable technology, including innovative ways of exploring financing models.

Potential obstacles to financing agritech start-ups include :
- **Dependence on NGO funding:** Some agritech entrepreneurs may initially depend on NGO funding, but this dependence can hinder their transition to performance and financial viability.

- **The need for a grassroots approach**: The focus on funding can sometimes distract entrepreneurs from the necessary approach of identifying problems on the ground before looking for technological solutions.

The discussions also highlighted a number of key success factors, including:
- **Facilitating the financing of agritech start-ups:** This will involve encouraging entrepreneurs to adopt self-financing models in order to strengthen their confidence and resilience in the face of the realities of external financing.
- **Strengthening digital skills** by investing in basic digital skills for agricultural entrepreneurs, which will make it easier for them to adopt technological solutions.
- **Lobbying and co-financing** by individuals are strategies for overcoming funding challenges.
- **Co-creation** between local innovators and international organisations, as illustrated by the COPEN project, facilitates the creation of fruitful partnerships between NGOs and start-ups.
- **Designing economically viable models**: Start-ups need to design economically viable business models, focusing on sustainability and economic stability.
- **Innovation in processing**: Encouraging innovation in the processing of agricultural products boosts income through value addition, as in the case of groundnut oil production.

Facilitating the financing of agritech start-ups relies on economically viable models, strengthening digital skills, co-creation, and lobbying. Funding has a significant impact on access to credit and the deployment of innovative solutions, while the sustainability of business models is essential to ensure the longevity of agritech solutions in the local context. While funding is essential for the development of agritech start-ups, over-reliance, particularly on NGO funding, can be a barrier to long-term performance. It is crucial to adopt a balanced approach, focusing on economically viable models, innovation, and a thorough understanding of local realities.

The last panel examined interoperability through practical examples. Interoperability is defined as the ability of different systems, organisations, or stakeholders to work together harmoniously and efficiently. It therefore involves connection, collaboration, and coordination between different entities, facilitating the fluid exchange of information, data, and processes.

Actions taken to facilitate interoperability include :
- **Setting up communities of practice** to connect players in the agricultural sector and encourage the exchange of information and data. One example is the [Accelerating Impacts of CGIAR Climate Research for Africa](#) (AICCRA) programme, which contributes to the emergence of a climate-smart Africa through science and innovation in agriculture.
- **The creation of information service communities**, such as [N'kalo](#), which collects data at several levels, carries out cross-analyses and disseminates it through various channels to inform and advise stakeholders in the agricultural value chain.
- **Digital strategies** such as the one initiated by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), which is helping the Senegalese government to set up an interoperability platform and a national cloud to support digital transformation.

Despite the existence of relevant initiatives, challenges persist and relate to the need to establish a climate of trust between stakeholders to facilitate data sharing, the identification of data sources and

their reliability, the creation of well-thought-out and approved data-sharing policies, and the need for digital identity and traceability to guarantee data reliability.

Interoperability is crucial to the success of digital transformation, but it requires a collaborative approach, trust, thoughtful policies, and appropriate governance to overcome the challenges and fully exploit the opportunities.

The prospects for the future include the development of a collaborative ecosystem to promote interoperability, the establishment of solid data governance essential for managing data in a transparent and ethical manner, the certification of data by trusted entities such as the [Agence Nationale des Statistiques et de la Démographie](#) in Senegal, and the continuation of discussions on data sovereignty to establish policies for the acquisition, sharing, and use of data.

CONCLUSION AND RECOMMENDATIONS

The event was a knowledge-rich platform, offering varied perspectives on agricultural digital transformation in West and Central Africa. Sessions shared successes, challenges, and lessons learned, creating a stimulating dialogue between key players in the sector. The stated objectives were successfully achieved, strengthening the knowledge base, fostering collaboration between partners, highlighting the impact of policies, and deepening understanding of the sustainability and interoperability of digital systems.

Some recommendations that emerged from the discussions include:

1. **Concrete actions:** Transform the lessons learned from the sessions into concrete actions. Encourage the implementation of pilot projects and initiatives based on the best practices shared at the event.
2. **Support for local innovation:** Put in place financial and technical support mechanisms to encourage local innovators. Encourage the emergence of start-ups and local initiatives that meet the specific needs of the region's farmers.
3. **Policy development:** Use the recommendations made at the event to guide the development of national and regional policies favourable to agricultural digital transformation. This could include tax incentives, subsidy programmes, and innovation-friendly regulations.
4. **Strengthening institutional links:** Promote strong institutional partnerships between governments, the private sector, civil society, and development organisations. These alliances can foster the successful implementation of policies and the achievement of digital transformation objectives.
5. **Continuing education:** Develop continuing education programmes for players in the agricultural sector. These programmes could focus on the adoption of new technologies, data management, and raising awareness of the importance of digital transformation.
6. **Continuity of dialogue:** Encourage the continuity of discussions initiated at the event. Regular forums and online platforms can be set up to maintain information sharing and networking between participants.
7. **Monitoring and evaluation:** Establish a monitoring and evaluation mechanism to measure the impact of the initiatives implemented following the event. This will enable approaches to be adjusted in light of feedback and ensure ongoing development