IoT - A Perspective for Indian Agriculture Sector

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Battlefield of Indian Agriculture & Farming Business

Demographics
- Political Impact
- Social Culture
- Age Old Practices
- Terrain & Environment
- Culture

Market Driven
- Local Pricing
- Logistics
- Technology
  - IoT, Mobile, Life Science, Crop Science, Soil Science
  - Tech Start-ups

Economics
- Funds Availability
  - Loans
  - Subsidy
  - Pawn / Local Borrowing
  - Return Per Acre

Core Agri-Business
- Farm Management
- Economic Viability?
- Reliable Source of Income?

Core Farming
- Farm Inputs, COP, Outputs, Cultivation Methods, Cropping Patterns, Land Resources.

Small & Marginal Farmer
- Govt Aids, NGO, KVK, Univ. Local Bodies.

Farming Support
- Farmer Producing Company
- Organic Farming
- Co-operative Farming
- Corporate Farming

Input Suppliers

Tech Provider
Agriculture Opportunity for IoT and New Business Models

IoT for Agriculture will evolve in the order of their necessity for farmers and the benefits it offers. Gamut of IoT applications that are going to evolve and soon we will see mushrooming of IoT based applications, same as you are witnessing today for the Mobile Apps.

3. **Labor Productivity**: SMART Harvesting - Cotton / Cashew Picking Robotic Arm as one example.
5. **Cultivation** - Soil Sciences(Ph, Temp, Humidity, Nutrients analysis), On Farm Bio-Technology : Pest Control & Prevention, Growth Stage-wise / daily monitoring (Nursery, Silk Farming)
6. **Mechanization** - Equipments, Tools and automation. Farm Input & Out Put Side Supply Chain
8. **Environment Impacts** - Predictive tools for Weather; Disease Migration & crop protection
9. **Policy Matters** - Enabling Govt and Local Administration for enforcing the policy, implementing program, spreading awareness, online training, etc...

All these innovations for real-life application are going to be evolved based on the current technology of: Cloud, Mobile, Remote Sensing, Data Analytics. Thus ‘IoT for agriculture’ phenomenon is going to ride on the convergence of technologies and an interdisciplinary field of applications. Most importantly the maturity of Agribusiness shall dictate the adoption & leveraging this technology explosion around them!
Managing Agribusiness for Migrating to IoT

Changing the landscape of agribusiness through a systematic and step by step building the maturity of farming community or Users. So that they are able to adapt it well.

The starting point for the migration or adoption of IoT can be based on the first product chosen – some may start with Soil Science like PH and Nutrient Analysis and other through Crop-Life-Science, like crop protection and disease control, while some others through mechanized equipments like SMART harvesting etc..
Managing Technology - Open Architecture & IT Infrastructure

Physical Object Layer

Ecosystem & Collaboration Space
Multi-actor approach, Governance, Security, Privacy, Business Models

- IoT integrators
- App/Service Developers
- Researchers
- Agri-end users
- Infrastructure & Technology Providers

Open IoT Architecture & Infrastructure
Event-driven, Configurable, Customizable

Standardisation
EPCIS
ISO11783

Starting with Product to Product System to the System of Systems; The IoT for Agriculture needs to evolve to provide a comprehensive Open Architecture & Infrastructure, that is then easy to deploy and use for the respective applications.

- Integrating a multitude of IoT devices supporting the whole value chain
- Consortium of technology and service providers
- Moving Towards data-driven farming, autonomous operations, virtualized food chains and personal nutrition.
- Need for the Reliable and Secured IoT Systems.
SMART Agriculture using IoT – Big Picture!

- Farm Management
- smart sensing & monitoring
- Precision /SMART Farming
- BIG DATA
- Back End Analytics - AI
- SMART Dairy
- smart control
- smart analysis & planning
- Mechanized Cultivation & Harvesting

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Conclusion - Key Perspectives:
What we are going to achieve in the end with IoT for Agriculture?

✓ **India’s Agriculture GDP or average pre-acre farm production will change substantially!!** This is about just half as that of the word average!

✓ **IoT – the convergence of technologies will offer immediate productivity enhancement to Agriculture and allied businesses.** Large scale adoption of SMART Farming & SMART Processing will change the way farming is done till now.

✓ **Farmers will always be connected with the farm activities - wherever you are – on the farm or off the field.** India will play a major role in deploying technology IoT can be the single most driver in its manifestation of varied applications for farming, with promise to stay always connected.

✓ **Predictive tools and models shall lead to better control & security of Crops, Equipments, Livestock and others.** Efficient resource management & better productivity due to informed decision making. Converging every bit of information from diverse fields (life-science, crop-science, equipments, sensors etc.)

✓ **Minimum Control Price regime may eventually end!** Food Supply Chain can become much more predictive for the demand / supply gaps verses need for production of food. Thus facilitating the market driven fair pricing.

✓ **Zero Chemical Inputs for Food Production becomes reality.** – shall have the profound impact on human life. In terms of chemical residue related disease

✓ **Protection of the Bio-diversity & Environment** will be easy by optimum use of natural resource in as much quantity as minimum required for the farming.

✓ **Deployment of Technology will help in addressing multitude of challenges** that has marred the agriculture sector in India today.
Thank You!

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