The TCS PRIDE™ Model – Empowering Farmers!

Using Digital Five Forces to Revolutionize Agriculture:
- Better Prices
- Cost Reduction
- Mitigate Risk
- Improve Supply Chain efficiency
- Increase Yield

Srinivasu Pappula, Ph.D., CISSP.
Global Head – Digital Farming Initiatives, TCS
Impact on Farmers – To Date

Pesticides
- Average Reduction - 15%

Fertilizer
- Average Reduction – 10%

Yield
- Average Increase – 48%

Profitability
- Average Increase – 45%

Compliance to best practices
- Average Increase – 75%

PRIDE™ Members
- Access to grants – Rs. 5K/acre
TCS Digital Farming Initiative - Mission

Improve farmer livelihoods through technology and partnerships

“Smart Villages”

“Climate Smart” & “Market Smart”

Leverage collective power of partners and farmers to create sustainable ecosystems – PRIDE™s

Confluence of Digital Five Forces, GIS & Proprietary Agri Knowledge Base

Digital Transformation Powered by the TCS Digital Farming Platform

“Smart Villages”

“Climate Smart”

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Digital Transformation Powered by the TCS Digital Farming Platform
TCS Digital Farming Initiative - Objectives

Objective 1: Improve crop production, efficiency
- through cyclic optimization process

Objective 2: Establishing ‘linkages’ across partnership ecosystems
- Forward & Backward linkages
- Access to support groups

Data Collection
Analysis & Evaluation
Management/Planning
On field operations

Government
Industry/standards bodies
Markets
Agri input companies
The 3Ss

Scalability

Suitability

Sustainability
Integra Precision Agriculture Solutions

CONNECTED EDGE
Devices & equipment capturing sensor data, taking action

Compute Intelligence at the EDGE
- Download Disease Prediction Models and other Agri related Models from the Cloud
- Enable Real-time Data Processing & Analytics

TURN DATA INTO INSIGHT
Process, store data, Cloud analytics, Manage devices, Precise networks

PRECISION AGRICULTURE
Actionable Information, Automate Operations

TATA CONSULTANCY SERVICES
Experience certainty.
Towards Smart Farming

TCS Digital Farming Data Analytics Centre

RuPS
Drones
Satellite Images
Crop Data
Farmer Data
Sail Data
Market Data
Weather Data
Sensors

Analyzed Data sent to various Agri stakeholders - DaaS

Agri-Input Companies
Credit Co. / Banks
Insurance Companies
Farmers
Domestic & Export Markets
Government
Research Institutes
Phase 1: Crop Planning

Goals
- Reduce Cost
- Get more Yield
- Get more profit

Question? Which Crop to sow?

Crop Plan Options

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
<th>Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1</td>
<td>X</td>
<td>X + 50</td>
</tr>
<tr>
<td>Option 2</td>
<td>Y</td>
<td>Y + 100</td>
</tr>
</tbody>
</table>

Crop Protocol

Market Trends & Demand Forecast

Irrigation
Farm
Livestock
Cash in Hand
Land & Soil data
Farmer’s Financial & Risk Profile
CROPS™
Agro Climate Info dB
General Protocol
AgriKnoB™

TATA CONSULTANCY SERVICES
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Phase 2: Aggregation & Ordering

Crop Plan Options

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Consolidated Agro Input
Demand for Seeds, Fertilizer, Pesticide, Irrigation, Labor, etc.
Phase 3: Crop cycle management

- Sensor
- Weather Forecast
- Drone
- Satellite
- Disease Prediction System
- TCUP
- mKRISHI® Data Center
- CROPSTM
- Crop Protocol
- AgriKnoB™
- AgriComms™
- Export Market Compliance
- Farm Traceability & Certification
- Yield Monitoring, Impact Monitoring
- Agro Expert
- Farmer (Participatory Sensor)
- AWS
- Actual Weather
- Disease Models
- Farmer
- Internet Network
- Web Console
- Expert Advice
- Crop Protocol Prediction
- Disease Prediction System
- Disease Models
- Farm
- Export Market Compliance
- P1
- P2
- P3
- P3a
- P3c
- P4
Phase 4: Harvest Planning

Local (PRIDE / Village) Storage → Processing Center

Crop Protocol → CROPSTM

AgriCommsTM → Logistics Manager

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What is a PRIDE™?

Progressive Rural Integrated Digital Enterprise

- Intersection of Technology, Agriculture and Business Management
- Self-sustaining, economically viable entity
  - Made possible through technology intervention
    - Standardized processes
    - Improved data visibility
    - Enabling data analytics
    - Demand-driven production
Objectives of PRIDE™s

Leverage ICT to **transform** the 19th Century Agricultural practices into 21st Century by **connecting farmers with partners and experts** of agriculture eco system and promoting **scientific farming**.

Leverage ICT to achieve **economies of scale** through aggregation of land-holdings, supply of market produce and demand for agri-inputs.

Provide personalized, farmer specific bouquet of services like Agro Advisory, Best Practices, Crop Rotation and Planning, Alert Services, Procurement etc. on mobile in local language for Value Creation.
PRIDE™ – Bridging the Gap

- Aggregated landholdings
- Fragmented landholdings
- Traditional farming
- Scientific farming practices
- Poor access to markets & agri-inputs
- Better bargaining power
- Lack of relevant agri-info
- Right info at the right time

Powered by mKRISHI®
PRIDE™ – Interacting with stakeholders

Government / Research Organization

- Government Agencies
- NGOs / KVKs
- Agriculture universities
- Research institutes

Agro Supply Companies

- Seed companies
- Fertilizer companies
- Pesticide companies
- Farm equipment companies
- Weather services
- Banks
- Insurance companies

Agro Produce Market

- Export organisations
- Food processing industries (Contract Farming, Sugar, Dairy, Poultry, Animal Husbandry etc)
- Retailers/Caterers/Procurers

Farming Community

- Farmers (crops, cattle, poultry, fisheries etc) - (member of producer organizations)

Each of the government agro organisations, agro supply and agro produce companies are potential customers.

PRIDE – For leveraging maximum offerings of mKRISHI® platform.
Finally…

mKRISHI® is a Business solution involving:

- Numerous Technologies
- Consortium Ecosystem, and
- a sustainable Business Model

Characteristics:
- On Mobile,
- Farmer Specific and
- in Local language.

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TCS’ award winning Agri-Solution Platform

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**Ecosystem**

- Dairy
- Seed
- Poultry
- Fertilizer
- Pesticide
- Government
- Agriculture Insurance
- Agriculture Universities/NRC

**Need**

- Which Crop? Variety? suitable to my soil?
- Will it Rain tomorrow? Will there be high temperature?
- Is labor available? Is Tractor, Harvester available?
- Where is the seed / pesticide available? Is the price right? Can I get it by tomorrow?
- What is the market price? What different should I do to get more price?

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**Platform**

- NASSCOM Social Innovation Honors (2010)
- Aegis Graham Bell Innovation Award 2010
- eINDIA Awards 2010
- Stockholm Challenge 2010 (Eco Dev) Honorable mentions
- Business World Infocomm 2012
- Best CIO 2012 IT for Social Cause Award
- Highly Commended Award - Big Tick Business in the Community Excellence 2013

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*Qualcomm’s Wireless Reach Initiative Award (2007)*
*Wall Street Journal Global Innovation Technology Award (2008)*
*Golden Peacock Award for Innovation (2008)*
NASSCOM Top 50 Innovation Recognition (2009)
India Innovation Initiative (i3) Award (2009)
Questions?

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Thank You
Backup
Digital Farming – Case Study
Project Objective

Objective

• Visualize risks associated in Agriculture
• Due to Pest, Disease, other factors
• Based on predefined rules

Actions

• Intimate farmers/producers with appropriate actions
• Trigger sales of required agri inputs based on risk level
• Trigger crop consultancy and auditing services
• Analyze the trend of risks and prediction
Project Description

Framework
- Data pull service from file server
- Rule based modelling engine
- Automated Image generation using R
- Automated uploads of images to Google Maps Engine
- Creation of smart UI elements in the front end - pulling appropriate images from Google Maps Engine- Rendering on Google Maps

Features Built
- Plot registration and Search
- Plot Visualization
  - Weather Layer with graph
  - Cloud Layer
  - Incident Layer
  - Fusion Layer
  - Risk Layer
Plot Visualization (Temperature & Weather Layer)
Plot Visualization: Weather Graphs
Plot Visualization: Incident Layer & Risk Layer
Finally…

“The effective execution of a Plan is what counts and not mere planning on paper; it is not what we put on our plate or even what we eat that provides nourishment and growth, but what we digest.”


JRD Tata