ntegrating the Transfer of echnology to Users

008 Fluid Forum

Olson
aic Fertilizer, LLC

Marc Vanacht
AG Business Consultants

AG Business Consultants

T. in Agriculture
Quick History

Early Days

- 1960ies & 1970ies ... mainframes & minis In agriculture??? Are you kidding?
- Early - mid 1980ies ... emergence of the P.C. And then grain export markets closed.
- Late eighties ... models & simulations. However: user unfriendly, Ivory Tower

1990ies: GPS & GIS

- Initially GIS was too ‘heavy’ for P.C.s, and GPS was too ‘clunky’ to be practical
- Mid 1990ies: ESRI made GIS realistic, and dGPS made “spatial operations” workable.
- 1995 1st InfoAg Conference was held
- High enthusiasm, experiments & mistake
- There also was the wwweb
- But then, commodity prices fell ....

Lately …

- There is money !
- Navigation - Lightbars - Autosteer - Telemetry
- Access to satellite images
- Integration of software / software service data services
- Web2 Technologies

So …

- All farmers are converted to I.T. / GPS / GIS
- All agronomy / plant protection / fertility decisions are strictly rational & scientific
- Virtual “coffee shops” are the dominant source of innovation
- Farmers & dealers exchange all sorts of data

Sure …

A Realtime case study…

- You will learn the “Rest of the Story when I close…

Why are we
still
chasing our dream?

Cycles ...

- Adoption cycles in agriculture are slower than the innovation cycles in technology
  - We keep innovating, but hardly ever “finish the job”, leaving disappointed customers / obsolete systems
- Adoption of I.T. in agriculture has been stunted several times by cyclical econom pressure on farmers

Complexity

- We’re trying to manage unpredictable weather & complex biological pathways. Interactions are extremely complex.
- GIS is good in spatial dimension, but doe not easily help in the time dimension.

Human Interaction

- Adoption of I.T. in agriculture is “lumpy”, high in some places, low in others
- Factors:
  - training/corporate drive (dealer/coops)
  - attitudes & ‘leader farmers’
  - agronomic fit & need of technology

Source: Pete Novak, Professor Rural Sociology, University of Wi

Not just farmers

- For some decades medical profession ha
  been thought to be ready for I.T. adoption
- Clerical aspects of healthcare adopted I.T
- Medical professionals are more reluctant
- What do Physicians and Farmers have in
  common?

tructural Change in Agriculture

Expanding Role

- **F**ood for survival & health
- **F**iber for clothing & fashion
- **F**eed for meat & pets
- **F**uel for climate & independence

More challenges

- Water: availability & quality
- Soil: exhaustion & encroachment
- Labor: availability - cost - quality
- Demands: Consumers - Regulators - Retailers
- Smaller share of GDP

Past Value Chains

- Make stuff for farmers
- Sell stuff to farmers
  - Farmers
    - Buy stuff from farmers
      - Transform commodities into food
      - Get food to consumers

Past Value Chains

- Linear
- Different for different vertical chains
- Local - Not global
- Multi-functional players not recognized
- Farmer centric - NOT Consumer centric

Today's Concepts

- Many new concepts of value chain
- Technology & Globalization really matter
- More emphasis on "Services" vs. "Gooc
- "Quality" vs. "Commodity" unresolved
- Example: analysts @ a major "Private Banking" company (€ 1.5 M. minimum)

New Value Chain

Financial Services: Risk Management, Seasonal credit, Investment ca

Real Capital Goods:
Land, Plantations,
Animal Confinement,
Rail lines, Elevators,
Terminals, Depots ...

Variable Inputs:
Feed & Pharmacy,
Seeds & Biotech,
Chemicals,
Fertilizer ...

Farm Operations:
Equipment,
Contracting,
Transport ...

Transforn Marketing Sales, Distributi

Information Services: Weather, Environmental Data, Royalties, Traceab Certifications ...

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What functions do you perform ?

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Are these functions treated as a source profit ?

T. in Agriculture
urprises,
r not ?

“Big Iron” Systems

- IBM services the ‘back room’ I.T. functio
  at Cargill and Monsanto.
- EDS services the ‘back room’ I.T. functi
  at Del Monte
- HitachiSoft services the ‘back room’ I.T.
  function at major food importers in Japa
- Etc...

High Numbers

- Tokachi Prefecture - Hokkaido - Japan:
  - GIS, Agronomy, Planning, Inputs
  - HitachiSoft - 10 k seats
- Across Europe - Grain, Animal, Veg's, Vine:
  - Accounting, GIS, Agronomy, Traceability
  - ISAGRI - 45 k seats

High Penetration

- HitachiSoft in Tokachi, Hokkaido - Cooperatives - ~ 100%
- AgroAmigo in cereals in Chile - Leading farmers - Majority of acres

Discreetly

- Some companies run part of the “back room” agronomy / farm service systems
  - ZedX (Wilbur Ellis ...)
  - GeoSys (Mosaic)
  - SST (Helena...)

Part of Broader Service

- GrowingPoint from Pioneer @https://www.pioneer.com/growingpoint
- FieldInSite from Mosaic @http://www.fieldinsite.com
- ...

Corporate Focus

- SST
- Farmworks
- ....

Boneyard

- Infielder (Monsanto)
- VantagePoint (Deere)
- ...

Basic Principles

BMP's Foundation

- Source: Dr. Terry L. Roberts, Better Crops with Plant Food, IPNI, 2007, # 4
- Right Product
- Right Rate
- Right Time
- Right Place

- Right Product
- Right Rate
- Right Time
- Right Place

- Right Pla
- Right Tim
- Right Rat
- Right Pro

Source: Dr. Terry L. Roberts, Better Crops with Plant Food, IPNI, 2007,

Or better…

- Right Place
- Right Time
- Right Rate
- Right Product

ink
MP's & I.T. for
armers' Benefit

The Right Place

- Obviously, GPS and GIS make sense
- Library data (soils, boundaries, images ..
- Farmer's experience (yield maps, crops, soil samples, moisture, OM, ...)
- Automate data capturing wherever possible
- Get away from the 2.5 acre = 1 ha grid
- Management zones that make sense

The Right Time

- Long term “nutrient & soil capital” build up
- Benchmark outcomes - Track deviations
- Tactical yield target approach for N
- Year to year / crop to crop comparison
- Prepare for / learn about on-the-go senso

The Right Rate

- “Right” in relation to space & time
- Several ways to manage ‘variable rate’
- Use yield response / nutrient use efficien models
- Spoon feed - Split – goal is Balanced Cro Nutrition
- Get and use ‘as applied’ feedback from equipment!!

The Right Product

- Download product catalogues and specs
- Think like for feed rations, menus, shado prices and cost optimization
- Think like an athlete, basics (NPK) and vitamins (micronutrients)
- The Science of Crop Nutrition is evolving Learn about & Try new formulations!

Managing Data Right

- Most software packages will get you and the farmers most of the way
- Adapt data ‘service level’ to skills, attitude and fears of your farmer customer
- Team work between agronomist - farmer equipment - I.T. specialist
- Google: hide complexity - duh factor

A Few Mythbusters

- Data ownership and data physical storag
  are independent decisions.
- No hard drive is blessed with perpetual li
- Moisture will affect inkjet maps
- Terabytes and RAID (Redundant Array of Independent Driv
  will fill up, sooner or later
- Network! Not just in the coffee shop.

Re-defining a Corporation: Pitney Bowes

Evolution

- For a long time Pitney Bowes ***sold*** ‘machines’ to automate ‘mail room’ functions
- Then Pitney Bowes ***leased*** ‘machines’ to automate ‘mail room’ functions
- Next Pitney Bowes ***serviced*** the mail room, which expanded to include the prin shop

Evolution contd.

- Pitney Bowes then moved beyond the ma
  room, and serviced ‘the entire ***building***’.
- Next: Pitney Bowes managed all ***assets***
  IN the building
- But not all assets are IN buildings, so
  Pitney Bowes started managing ***mobile***
  assets as well

Evolution Ongoing

- To manage mobile assets... one needs G
- Pitney Bowes now owns GIS, having bought MapInfo Software
- The new Business of Pitney Bowes is no**w**
  Location Intelligence

A Peak into the Future

Hardware

- Moore’s Law is alive and kicking, at least for 2-3 more iterations
- Wireless and telemetry are coming along strong
- From “ubiquitous computing” to “ubiquito GPS” place and time stamps

SAAS (Software as a Service)

- Starts penetrating business in general
- Technically available in agriculture
- Will grow, if ‘cultural’ challenges of target audience are managed well

New Value Chain

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Will you decide to participate?

Impact

- Re-definition of roles and functions in the value chain re-defines I. T. services
- Different farmers will play different roles, and will need different services
- Can a single entity give technology suppo in all aspects & all functions? (Inputs, operations, marketing, information...)

Integrated Service Model

- **Today**, the ISM includes
  - capital goods (warehouses & elevators),
  - distribution of variable inputs,
  - contracting,
  - seasonal credit and
  - some information services

Integrated Service Model

- In general business these integrated models have disaggregated (= fallen apa
- In finance attempts of integration (i.e CitiGroup) have had mixed results
- In technology NONE of the “convergence concepts have materialized

Integrated Service Model

- Information Services on their own will NO be enough to keep the Integrated Service Model alive, should the model disaggregate.
- However, should the Integrated Service Model remain strong, Information Service WILL help strengthen it.

Future will tell

"The Rest of the Story…."

- The grape grower standing in his field is Subhash Arve…outside the village of Boregaon in the Western Indian state of Maharashta.
- Tata Consultancy Services, Ltd had loaded specific software on his phone so he could talk to the Grape Growers Association consultant 140 miles away.
- Tata Group hopes the project will spearhea its push into rural markets…they have deci to participate in the "New Value Chain."

Thank You!!

- Two more thoughts…remember to

- “Always be learning” and
- “Never be afraid to sit awhile and think.”