

TITLE: Path to Sustainable Agriculture

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Abstract

For agriculture to progress along a sustainable path and accelerated economic development, process improvements aligned with technologies must generate increased productivity that is both profitable and more environmentally benign.

Lean combined with BPM (Business Process Management) technologies will help achieve optimized processes. Agriculture is an industry which requires a new way of thinking and so is true with the farmers. Current processes have lots of wastes and inefficiencies build into them. Effectively connecting the farmers, government, manufacturers, distributors, wholesalers, retailers and customers is very necessary to improve the effectiveness of the process.

Applying lean concepts in the field of agriculture can reduce wastes in traditional processes and greatly reduce the costs involved. Lean concepts augmented with BPM technology leaps farmers; inter related agro segments in the path towards sustainable agriculture productivity and growth.

Keywords

Sustainable Agriculture, Precision Agriculture (PA), Lean, Business Process Management (BPM), Business Activity Monitoring (BAM), Key Performance Indicators (KPIs)



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Introduction

“Agriculture is the backbone of developing world’s economy”. Agriculture provides the principal means of livelihood for over 60% of several developing nations’ population. Despite a steady decline in its share of the GDP (Gross Domestic Product), it remains the largest economic sector in these nations. Low and volatile growth rates and the recent escalation of agrarian crisis are a threat not only to national food security, but also to the economic well-being of the nation as a whole.

According to a report drafted for ministers of G-8 nations, the world faces “a permanent food crisis and global instability unless countries act now to feed a surging population by doubling agricultural output.” Agriculture plays a unique role in sustainability, providing food at a reasonable cost to current and future generations. Agriculture is in the doldrums in many developing countries, as small farmers find it harder to survive. Agriculture is an industry which requires a new way of thinking and so is true with the farmers.

India has the potential to be the world’s ‘food factory’ provided the various agro domain specific processes are re-engineered, optimized, automated and integrated utilizing Information & Communication Technology (ICT). Thus effectively connecting the farmers, government, manufacturers, distributors, wholesalers, retailers and customer is very necessary to improve the effectiveness of the process.

Traditional methods and processes have lots of wastes and inefficiencies build into them. Applying lean concepts in the field of agriculture can reduce wastes and greatly reduce the costs involved. Lean enabled by Business Process Management (BPM) accelerates farming, interrelated agro segments and improve governance in the path towards sustainable agriculture.

This paper addresses Path to Sustainable Agriculture in four sections: (1) Lean, BPM & Sustainable Agriculture defined (2) Current Challenges (3) How Lean BPM gels with agriculture industry (4) How Agriculture Industry benefits from Lean BPM

Lean, BPM & Sustainable Agriculture defined

Lean is a set of tools and techniques designed to reduce and eliminate waste or non value added activity in any given process. Lean principles are summarized as to eliminate waste, sustain knowledge, plan for change, deliver fast, empower the team, build quality in and optimize the whole. Lean emphasizes the elimination or reduction of steps that don't have value, uncover process waste and increase productivity.

Business Process Management (BPM) is a holistic management approach that promotes business effectiveness and efficiency while striving for innovation, flexibility and integration with technology. BPM attempts to continuously improve processes. BPM simplifies process improvement with the real-time visibility, control and analytics needed to improve business performance.

Sustainable agriculture integrates three main goals: Environmental stewardship, farm profitability and prosperous farming communities. In other words, it refers to the ability of farms to produce food indefinitely and economically, without causing severe or irreversible damage to ecosystem health.

Current Challenges

With the existing systems and processes, the challenges and issues faced by stake holders in the field of agriculture are manifold which are briefly listed below.

- ↳ Inefficient distribution of public or farmer assistance programs
- ↳ Farm assistance and funds not reaching eligible farmers or reaches with significant delays.
- ↳ Low bureaucratic accountability and inefficient use of public funds
- ↳ No Centralized portal for information seeking farmers
- ↳ Inadequate adoption of modern agricultural practices and technology
- ↳ Inappropriate research to connect or benefit small farmers
- ↳ Inadequate reach of sustainable agriculture practices and knowledge
- ↳ Slow progress of precision farming practices knowledge to farmers
- ↳ Availability of visual farming aids or visual education for small farmers is minimal and of low quality
- ↳ Woeful access to affordable credit for farmers
- ↳ In spite of farm employment providing better regular income, new generations turning away from agriculture due to the challenges listed
- ↳ Unavailability of accurate, timely statistics and alerts on farmer's cultivation database, their produce and harvest.

- ↪ Increased number of intermediaries increasing produce cost without any value add
- ↪ No centralized information of traders, manufacturers, retailers - an easy access to farmers for their direct deals bypassing intermediaries.
- ↪ Inadequate collaboration between Agriculture Boards / Universities / Research Institutions and farmers
- ↪ Inadequate Pest Management & Research
- ↪ Poor Productivity
- ↪ Distorted markets
- ↪ Produce that does not meet international standards
- ↪ Inappropriate water levels and overdependence on rainfall
- ↪ Deteriorating irrigation infrastructure
- ↪ Inadequate infrastructure and services in rural areas
- ↪ Billions of fruits and vegetables getting wasted or perished every year
- ↪ Junior farming schools not getting promoted similar to Junior technical schools
- ↪ Online and electronic agriculture land bank still in the nascent stage.
- ↪ Need of a centralized agriculture workers / farm hands job portal – useful for farm employers to address farm labour shortage.
- ↪ Quality real time data analytics unavailability for authorities to make smart decisions and policies
- ↪ Insufficient info on farmers cultivation database, their produce and harvest
- ↪ Unnecessary movement of raw materials aggravating logistics costs
- ↪ Weak natural resources management
- ↪ Unfavourable import and export policies

Each of the above challenges and issues could be mapped to the respective business processes for further improvements, automation and also lead to new innovative processes.

How Lean BPM gels with Agriculture Industry?

The Lean Methodology, its tools and techniques are simple and easy to understand and to implement. They are applicable in any type of industry, from Manufacturing to Public, Private and Agriculture sectors. They harness and empower the energy of everyone in an organisation, never isolating or working with a select few. It helps create a positive culture for continuous improvement, by allowing associates to take charge of their own work and subsequent areas, whilst also improving associate morale. It actively identifies and then removes waste with varied tools and techniques. It helps ensure best practice and reduces

variation in processes by standardisation. A few simple changes in one area with the implementation of Lean tools and techniques can almost instantly start illustrating the benefits that Lean can offer.

According to some researches more than 20% of agricultural products become unusable before it reach the end consumer in many countries. The public distribution, produce distribution, handling methods etc can be improved applying lean techniques. By educating people and using simple technology, waste can be reduced dramatically.

BPM is a structured approach that guides the methods, policies, metrics, management practices and technology required to manage and continuously optimise an organisation's processes and activities. BPM quantifies, predicts, monitors and optimises process performance. Success is measured by quantitative performance metrics and targets - whether based on cost, time, profit, efficiency or compliance.

BPM acts as a catalyst for transforming government activities by automating and simplifying processes, enforcing best practices, improving quality and productivity, and fostering collaboration internally and externally with other organizations, local governments, the private sector, and citizens. BPM can assist government administrative functions and departments in increasing efficiency and reducing operating costs. BPM can reduce redundant processes, streamline approvals, improve information flow, lower distribution costs, shorten approval times and integrate with disparate systems. The dynamic business rules component in BPM solutions supports quick implementation and adherence to "constantly changing" rules and regulations.

Being the part and parcel of BPM technology, Business Activity Monitoring (BAM) applies operational business intelligence and application integration technologies to automated processes to continually refine them based on feedback that comes directly from knowledge of operational events.

The fact that agriculture or any type of sustainability cannot be measured directly, BAM supports to gauge sustainability through benchmark indicators. BAM applies business intelligence on events, data and the defined indicators for visual presentation of information on dashboards that contain key performance indicators (KPIs). KPIs are used to provide assurance and visibility of activity and performance. In the case of government or agriculture ministry, they can get real time visual statistics and performance on dashboards for every

entity associated with their budgetary expenditures. And thereby BAM data points provide aggregated insight to executives or ministers involved in strategic planning.

The management of agriculture is undergoing a change with the advancement of Precision Agriculture (PA). PA is considered as the agriculture system of 21st century. Precision Agriculture involves integrated technologies such as Global Position System (GPS), Geographical Information System (GIS), Remote Sensing (RS), and Variable Rate Technology (VRT), crop models, yield monitors and precision irrigation. In brief, PA refers to tailoring crop and soil management practices according to variation in crop and soil conditions within each field.

The initial PA test results from a small group of farmers in India reflect an increase of 100-700% yield per hectare for selected crops, over the national average. The productivity is achieved with a focused collaboration of university researchers and farmers over a short span of 3 years in an area of ~400 hectares. The lean techniques is well applied in PA in reducing waste and increasing productivity with optimal usage of resources and best use of technology. For a wider application of precision agriculture or farming throughout India, BPM integrated with precision technologies is required for quick analysis or processing of the precision information and implementation of a management response at an appropriate scale and time.

'Lean BPM' is focused on radically simplifying how processes and management are delivered. It is the practice of streamlining and reducing costs associated with business process management solution.

How Agriculture Industry benefits from Lean BPM?

Lean BPM allows tremendous efficiency gains as the technology does much of the hard work. No longer will an online application be hidden in someone's in-tray nor a farmer's application is lost or processing delayed indefinitely.

There are three key advantages that Lean BPM can bring to the table:

- **Transparency:** Lean BPM makes a business process absolutely transparent, greatly improving visibility and efficiency. Bottlenecks can literally be seen, and removed. It can show where the most delays are occurring, and where is each transaction stuck as it passes from one stage to another.

- **Process refinement:** The initial configuration and design exercise coupled with the data that emerges after running processes for some time can allow continuous business activity monitoring (BAM) and refinement. The benefits are to enable an organization to make better informed, quickly address problem areas, and re-position to take full advantage of emerging opportunities.
- **Data Centralization:** Data about each and every transaction is logged and can be retrieved as and when required. Therefore, it is possible to analyze accurately what happened.

The need of the hour is not only improving and optimizing agriculture related business processes through Lean BPM, but also optimize the project implementation costs and accelerate delivery. In other words, to realize long-term, transformational results, start with a pragmatic approach. Use short-term project wins to show proof-points and build credibility, and then to leverage this into large projects areas. Leverage the incremental and measurable qualities of BPM to achieve repeatable success and benefits. This pragmatic approach in totality is 'Lean BPM'.

Proof-points should be demonstrated early, by focusing on discrete business area. In the words of management sage Peter Drucker, "Continuous process improvements in any one area eventually transform the business. They lead to innovation. They lead to new processes. They lead to new business." They lead to sustainable agriculture building efficiency, productivity and performance of the agriculture systems and practice; with a revived confidence of every stake holder.

Summary

With a "**Think Big, Start Smart & Deliver Quick**" mantra in implementation of Lean Business Process Management (BPM), related technologies and smart farming techniques, India can become the world's role model for organic produce and food factory navigating a sustainable agriculture path.

Nevertheless a win together approach will build a smart farmer, efficient government policies with expert judgement and quick decision making, profitable and competent business, entrepreneurship, stake holder collaborations and a happy customer. By reinstating farmers and all stake holders confidence with process improvements and automation, better inputs and agronomic practices, and post-harvest efficiencies - the forthcoming years could be ensured a '**golden era**' for agriculture, farmers, industry and customers.

'**Lean BPM**' will help accelerate not only the field of agriculture but also inject a winning proposition to every industry domain and benefactors - thereby mutually benefiting all.

References

- Business Process Management (BPM): The Third Wave by Howard Smith, Peteringar
- Lean Six Sigma Demystified By Jay Arthur
- John Schmidt : Lean Integration (Integration Consortium 2009)
- Mary Poppendieck and Tom Poppendieck, Implementing Lean Software Development: From Concept to Cash (Addison-Wesley, 2007).
- Wikipedia, the free Encyclopaedia <http://en.wikipedia.org>
- Zeegra Technologies http://www.zeegra.com/process_management.html | http://www.zeegra.com/enterprise_modernization.html | http://www.zeegra.com/green_business.html | <http://www.zeegra.com>
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