ESP Enterprise Science Platform™

L7INFORMATICS

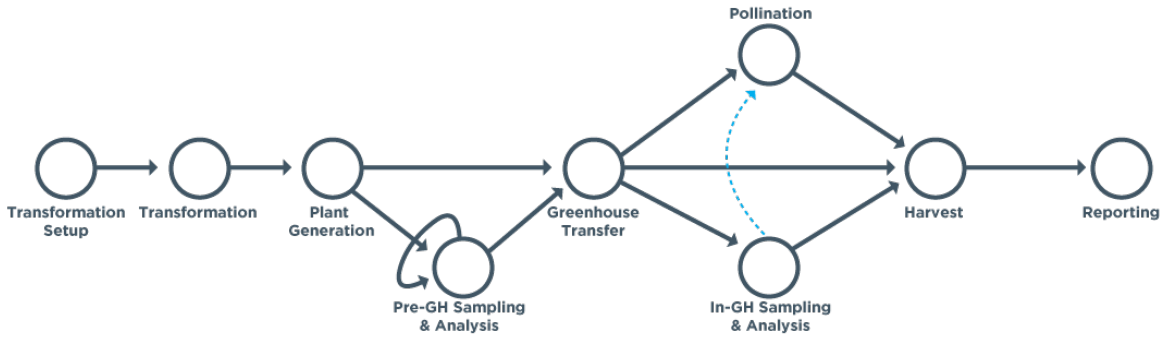
ESP Solution: Precision Agriculture

introduction

The increase in data volumes along with siloed software systems in precision agriculture research and development requires a modern end-to-end scientific information management solution that automates and synchronizes processes across all stakeholders giving complete visibility, control, and compliance.

L7's Enterprise Science Platform (ESP) is a scientific information management (SIM) platform designed for increasingly complex research and development organizations such as upstart genomic crop sciences companies, government research labs, and large industrial ag-bio companies. L7's ESP is a secure, scalable platform that selectively replaces existing in-house apps or overlays on top of your existing siloed software systems.

ESP offers a workflow management system that handles process orchestration and data provenance throughout the "transformation" workflow for "biolistics" or "CRISPR" experiments on any crops. We automate data management in everything from experimental setup, greenhouse transfers, pollination, harvesting, and reporting; all while providing an intuitive interface for barcode scanning (e.g. scanning plant samples into a 96-well block before sending it off for bioinformatic analysis), inventory management (e.g. for materials and media needed to operate the gene gun), and location management (tracking plant locations on benches in their greenhouses).



the challenge

Many challenges are leading to increased cost and reduced throughput, including:

- Lack of representation of the complex sample lineages from crops to seeds
- Lack of a single process automation platform
- Lack of operational dashboards and reporting
- Siloed software and instruments that reduce business velocity
- Process and data integrity by manual verification

ESP delivers quantifiable business impact

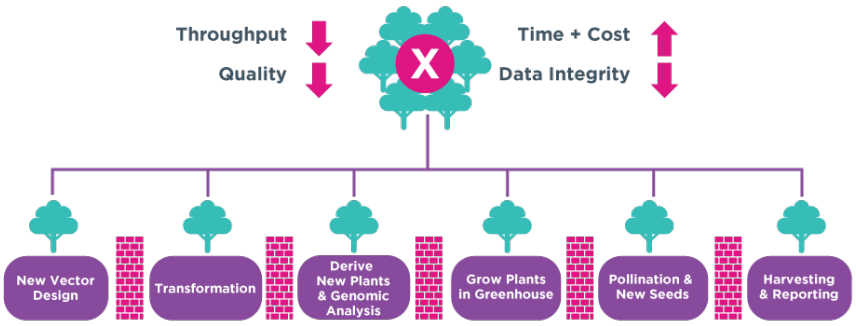
Sample-to-answer provenance for all precision agriculture research and development data

- Full and immediate traceability and auditability across all scientific processes and analytical procedures
- Workflow, Protocol, Pipeline, and Task versioning ensures reproducibility
- Sample Parent/Child relationships enable modeling of complex lineage patterns between vectors, seeds, and plants
- Inclusion of all supporting bio-informatics libraries ensuring tools "just work"
- A single source of provenance for all tools streamlines certification processes (e.g., FDA)

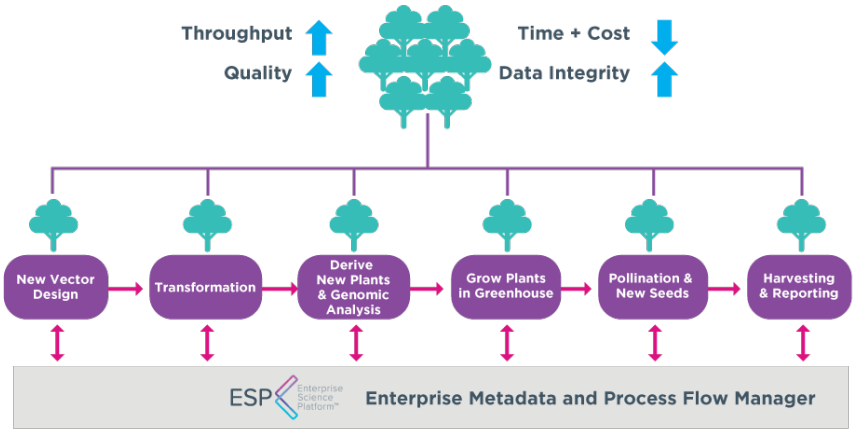
Built-in best-of-breed NGS LIMS app integrated with informatics pipeline management all in a single workflow with full support for multiple sample types with complex sample Parent/Child relationships to enable complex lineage patterns.

- Single unified cross-referenced data and meta-data providing full data provenance (including sample, experimental data, inventory data, freezer location data, bio-informatics analysis data) across the entire research workflow
- Single unified process model with full automation and real-time monitoring across the entire process (across internal and external stakeholders), central coordination of all workflow activities across departments and external partners
- Highly secure on-premise or cloud deployment with role-based permissions on data access
- Open API to develop own connectors and apps as the lab evolves over time
- ESP apps can retire legacy solutions when needed

Without ESP



With ESP



pre-built connectors

- NGS (NextSeq, HiSeq, MiSeq, iSeq, Novaseek, RS II, Sequel, ON Torrent, Sanger)
- Wetlab (LightCycler, LabChipGX, Spectramax, Biomek)
- QC Instrumentation (BioAnalyzer, NanoDrop, QuBit, DropSense, Tapestation, Fragment Analyzer)
- External Systems (LIMS, ELN, Billing Systems, EMR, ERP, Inventory Management, Shipping, Ordering, Label Printing)

pre-built apps

- Samples, LIMS, Locations, Inventory, Projects, Data, Analysis, Global Search, Ingest Data, Admin & Dashboards

why customers use ESP

- Rapid implementation: from kick off to go live in as little as 5-6 weeks
- A standard, platform independent, relocatable package structure enabling easy search, usage and deployment
- Configuration vs customization: easy-to-use interface supports the automation of complex AgBio processes
- Extend capital investment shelf life: overlay ESP on top of legacy software
- Extensibility – new transformation processes, apps and connectors can be built by customers

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