



Alchemy

Chemistry Acceleration Software

MNYCA

November 14, 2019

Digital Adoption Curve

#1 Basic
Digitalization

Digital Data

Basic Process
Automation

Project Portfolio
Management

#2 Strategic
Innovation

Digital Development

Product Portfolio
Analysis & Management

New Product
Categories

#3 Predictive
Chemistry

ML / AI For New
Molecules & Formulas

Custom Formulation
at Scale

New Delivery Models

IT Leaders

*Grow*_{2x} *Faster* Than

IT Laggards

Experts agree, workflow automation is profoundly impacting every industry.

McKinsey & Company

- Automating processes can deliver a **return on investment** that varies between **30% and 200%**
- Customers who work with a company that has implemented a workflow-driven platform have a **better overall customer experience**

ABERDEEN

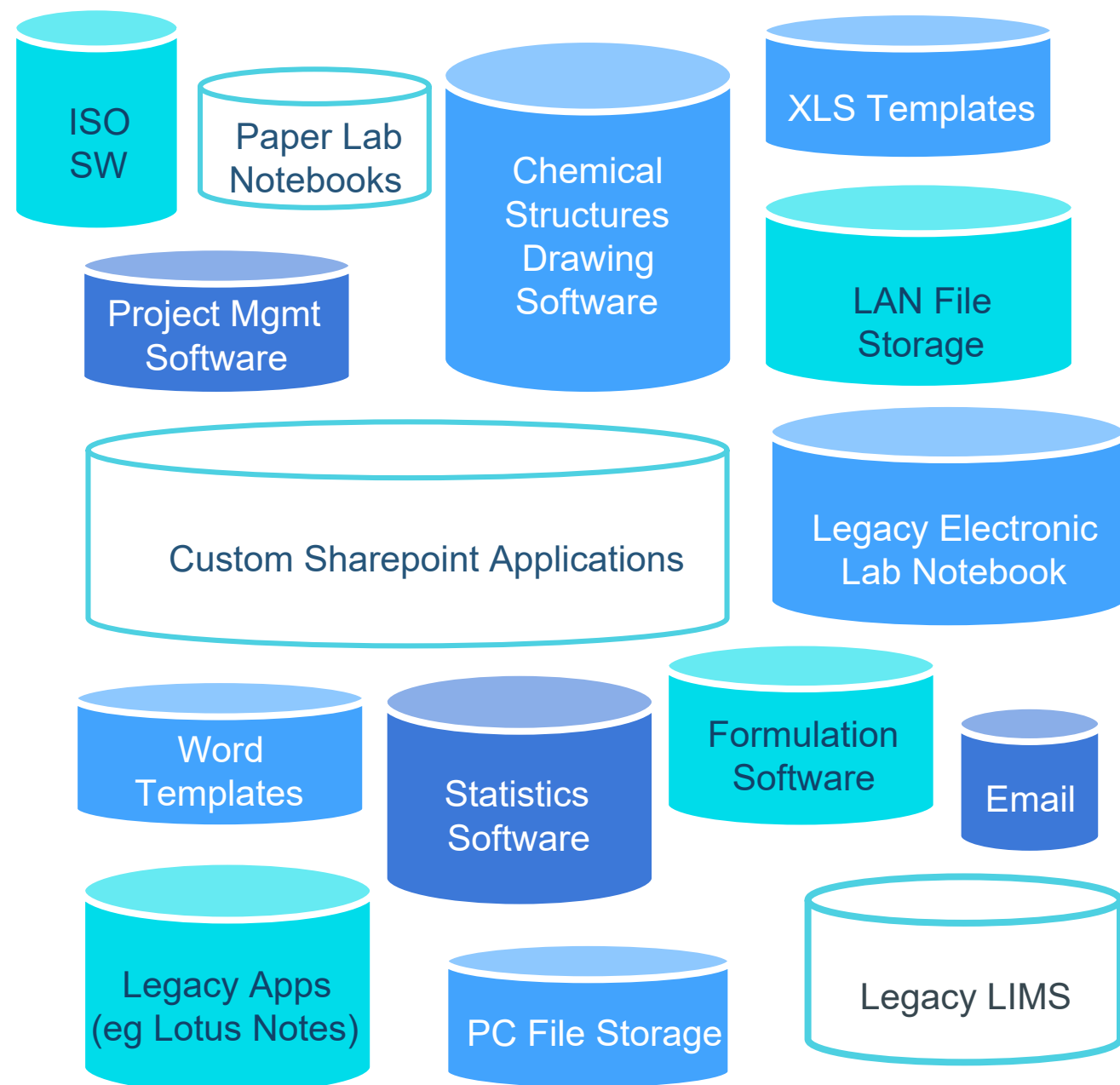
- **Best in class** companies are **95% more likely** to use business-focused **workflow automation** .
- **Ensures quality** by creating fail-safes, checks and balances, & metrics for greater predictability, responsiveness, and **continuous improvement**

1. "THE VALUE OF ROBOTIC PROCESS AUTOMATION", MCKINSEY

2. "INNOVATE WITH BUSINESS-DRIVEN WORKFLOW", ABERDEEN GROUP

Disconnected software tools vs. custom lab workflow automation.

Legacy Single-Purpose Tools & Data Silos



Next Generation Lab Workflow Automation



TODAY: Ideation > Lab

Step Name	Group	Technology Used	Common Challenges
Conceptualize New Product	Marketing	Word/PPT/XLS Email Meeting	<ul style="list-style-type: none"> - No one who will be doing the work is involved yet. - Potential for brief not to be clear to chemist(s).
Assess Technical Feasibility & Risk Assign Lab Manager	R&D Director	Word/PPT/XLS/MS Project Email Meeting, potentially Shared Drive	<ul style="list-style-type: none"> - This stage of the project is a bit of a black box. - Many of these early decision are based on experience and industry knowledge, to weigh in on feasibility and how heavy the lift might be.
Kick Off Project	Lab Manager	Word/PPT/XLS/MS Project Email Meeting	<ul style="list-style-type: none"> - Create project timeline & cost estimate - Gantt charts are not living, must manually adjust them and then email everyone new versions
Assign Chemist(s) to Project	Lab Manager	Email Meeting XLS	<ul style="list-style-type: none"> - Each manager maintains project lists for their teams, often in XLS. - Resources are adjusted through conversation/email. - May be difficult to find chemist(s) with the correct expertise or availability. - May have to staff with people in two labs/locations. - Prioritization is a HUGE problem - not uncommon for over 75% of projects Priority 1

TODAY: Lab > Production

Step Name	Group	Technology Used	Common Challenges
Formulate Product	Chemist(s)	Paper/e lab notebooks XLS / PPT Formulation software Email	<ul style="list-style-type: none"> - If multiple chemists, how does each know what the other is doing? - When multiple labs involved, exponentially harder. - Formulations stored under a specific person / specific name, so only 1 person sees them unless that person proactively shares. - Potential for something at the top to change (product brief, new requirements, regulatory) and not get communicated to chemists. - <20% simply not doable.
Project Status (Throughout)	Chemist(s)	Paper/e lab notebooks XLS / PPT Email Meetings/presentations	<ul style="list-style-type: none"> - Individuals with XLS and paper lab notebooks - nothing is seamlessly linked. - Can require searching through emails for trail of what was done. - Admin tasks on top of actual work.
Assess New Raw Materials (If required)	Chemist(s)	Emails Phone calls	<ul style="list-style-type: none"> - Cross functional emailing and phone calling. - If new raw mat is unavailable, could have to start ARM testing all over.
EH&S screen	EH&S Group	Emails ERP	<ul style="list-style-type: none"> - EH&S is typically a low staffed function. - This process can linger unless more communication is give to raise the priority.
Scale Up	Manufacturing	Emails XLS ERP	<ul style="list-style-type: none"> - Lots of emails. - 25-30% of time can't scale it.

Workflow automation gets the right data and right tools to the right person at the right time to do their job.

The screenshot displays the Alchemy software interface for a Lab Work Request (LWR-0073). The interface includes a navigation sidebar, a search bar, and a main content area with tabs for Details, Q&A, Workflow, Gantt Chart, Team (8), Files (1), and Activity. The main content area shows a workflow with steps like "Measure samples for gloss retention" and "Change the temperature standard". Below the workflow, there is a "Step Form" and "QUVA - Test Results" section. A table of UV Weathering Test Results is shown, along with a chemical structure for Decanedioic acid, 1,10-bis(1,2,2,6,6-pentamethylpiperidin-3-yl)decane-1,10-dioic acid. A bar chart titled "QUVA Results - Gloss Retention by Substrate" shows gloss measurement at 20 degrees over 24, 48, and 72 hours for Steel, Aluminium, Glass, and Tin. A pie chart is also visible in the top right corner.

Light Source	Formulation	Substrate	Film Thickness	Hours	
1	QUVA	RT-554633	Steel	1.28	24
2	QUVA	RT-554633	Aluminium	1.25	24
3	QUVA	RT-554633	Glass	1.27	24
4	QUVA	RT-554633	Tin Plate	1.25	24

Hours in UV Chamber	STEEL	ALUMINIUM	GLASS	TIN
24 Hours	10	4	4	4
48 Hours	4	3	3	4
72 Hours	40	18	18	5

Work Smarter

Move Faster

Win More Business

Addressing the gap in the lab, accelerates product development and improves service delivery.

CRM

- Companies
- Contacts
- Calls
- Meetings
- Opportunities
- Sales
- Salesforce Performance



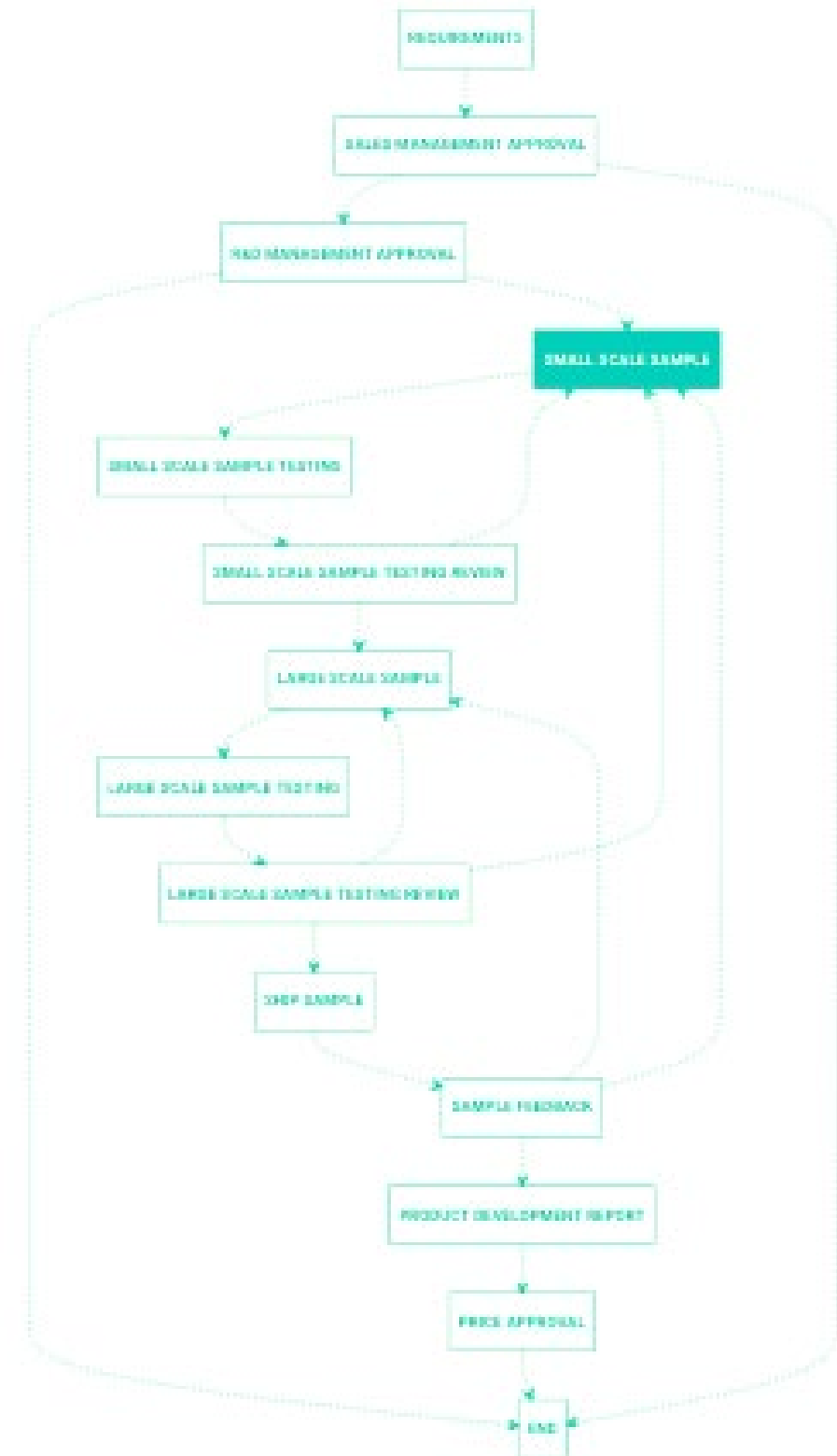
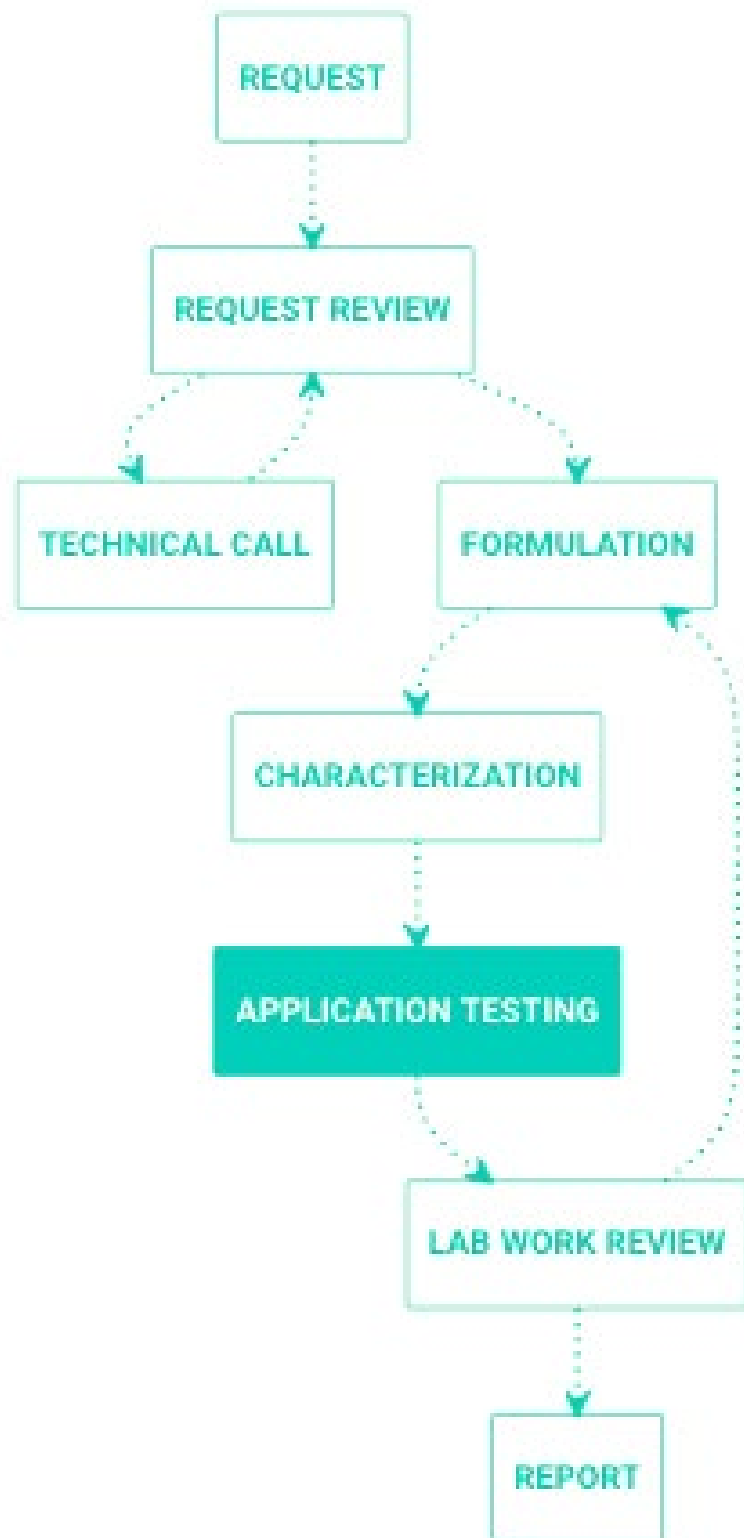
- *Innovation Management*
- *R&D*
- *New Product Development*
- *Product Enhancements*
- *Scale Up*
- *EH&S*
- *QAS*
- *Alternative Raw Materials*
- *Test Requests*
- *Application Analysis*
- *Sample Fit for Use*

ERP

- Procurement
- Production
- Distribution
- Accounting
- HR
- Governance
- Compliance

Digital “After”

NPD can be more or less complicated depending on the company.



All project info in one place and accessible by appropriate team members.

1 of 38 | ★ **NPD1925 High Performance Automotive White Coating** | Lab Work Request | ACTIVE Application Testing

Details | **Q&A** | Workflow | **Gantt Chart** | Team (5) | Files (1) | Activity

Related Work Request Information

Related Opportunity
Ford Motors: High Performance Coatings

Request No.
FWR/2019_08_22_005

Work Request Description
Develop a high performance exterior black coating for the Ford Motor project linked above. The product must be stable over a 2 week period without any pigment floating or viscosity rising.

Details of Work
Draft a formulation that has the desired performance in spec with the customer's request.

DM **Devlin Monroe**
@team please see Ford's Product Brief attached.

Product Brief from Ford.png

Request Review

Last modified on Aug 22, 2019 by Dustin Thompson [More info](#)

1 TASK 0 NOTES

[Show Completed Tasks](#)

Step Form

Is the request approved?
Yes

Review Notes
-

All Steps (6)

- Request
- Request Review
- Formulation
- Characterization
- Application Testing**
- Lab Work Review

A customizable ELN for your chemistries and test methods.

Lab Work Information

Target Batch Size (g)

100.00

Number of Versions

2

Formulation Table

	Material Name	Material Type	Material Solids Content %	Material Density [g/cm3]	Original - Batch Size [g]	Version 1 - Batch Size [g]
1	EPON 828 Epoxy	Binder	78.00	1.16	65.00	65.00
2	Dispers 656	Dispersant	100.00	1.54	5.00	7.50
3	n - Butyl Acetate	Coalescence Aid	0.00	0.83	10.00	10.00
4	Ti Pure R-960	Pigment	100.00	3.90	15.00	15.00



Actual Batch Information

	Original	Version 1	Version 2	Version 3
Actual Batch Size [g]	95.00	97.50	100.00	0.00
Solids Content (%)	74.42	75.08	75.70	0.00
Binder Content (solids %)	53.37	52.00	50.70	0.00
Pigment/Filler Volume	3.85	3.85	3.85	0.00
Binder Volume	43.71	43.71	43.71	0.00
PVC	8.09	8.09	8.09	0.00

Bring together the best of XLS in a collaborative digital space.

Final Batch Size [g]

100.00

Finalization Table

	Material	Material Type	Original - Final Batch [g]	Version 1 - Final Batch [g]	Version 2 - Final.
1	EPON 828 Epoxy	Binder	65.00	65.00	65.00
2	Dispers 656	Dispersant	5.00	7.50	10.00
3	n - Butyl Acetate	Coalescence Aid	10.00	10.00	10.00
4	Ti Pure R-960	Pigment	15.00	15.00	15.00

Processing Details

Processing Equipment

Scandex

Stirrer Type

3

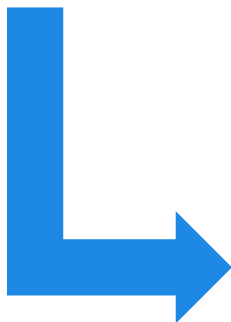
Revolution [m/sec]

180.00

Duration [sec]

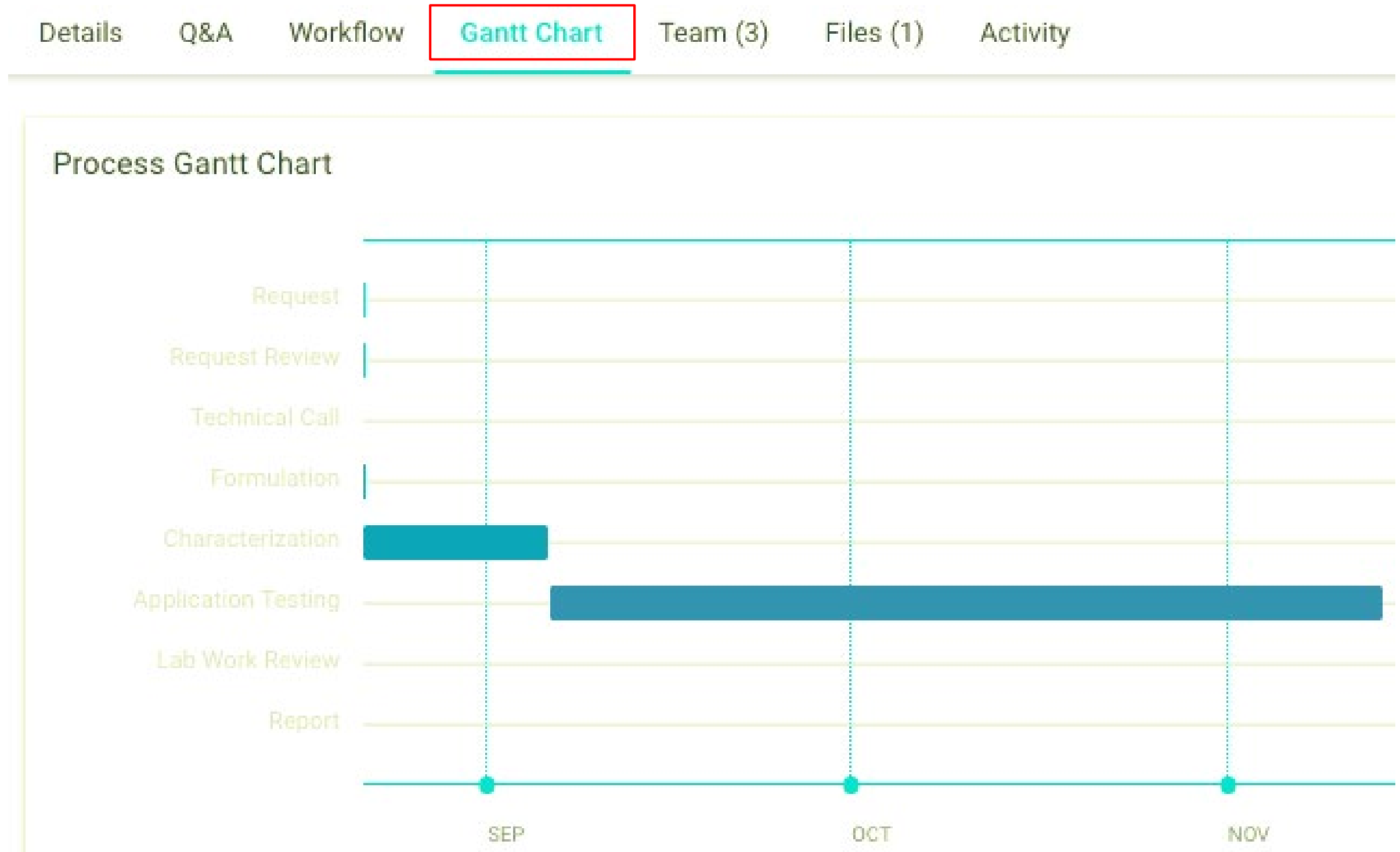
Pre-populate test methods and have selections drive XLS-like templates for data collection from humans or other systems.

Test Selection	
pH Test Needed?	✓
Density Test Needed?	—
Grind Test Needed?	✓
Viscosity Test Needed?	✓
Viscosity Drop Test Needed ?	—
Color Test Needed?	✓
Foaming Behavior Test Needed?	—
Draw-Down Test Needed?	—
Storage Stability Test Needed?	✓



pH Test Results						
	Temperature [°C] - pH	Original - pH	Version 1 - pH	Version 2 - pH		
1	25	6.85	6.55	6.86		
Include pH in the report? ✓						
Grind Test Results						
	Original - Grind	Version 1 - Grind	Version 2 - Grind			
1	7	9	9			
Include Grind in the report? ✓						
Viscosity Test Results						
	Temperature [°C] - Viscosity	Original - Viscosity [cps]	Version 1 - Viscosity [cps]	Version 2 - Viscosity [cps]		
1	25	1,093.34	1,046.48	950.62		
Include Viscosity in the report? ✓						
Color Test Results						
	Version	ΔL	Δa	Δb	ΔE	ΔC
1	Original	-1.0125	0.7037	1.2101	-0.8469	—
2	Version 1	-2.2392	1.6914	0.0185	0.2007	—
3	Version 2	-1.4412	0.5342	0.6738	-0.1605	—
4	Version 3	0.1913	2.0403	-0.3229	0.7920	—



Gantt charts automatically calculate time in each project phase.



Capture important info and communications in your project.

Q&A | Workflow | Gantt Chart | Team (5) | Files (1) | Activity

DM **Comment** *

B *I* U ~~S~~ ☰ ☷ x_2 x^2 ☰ ☷ ☷  

|

[+ ATTACH FILES](#)

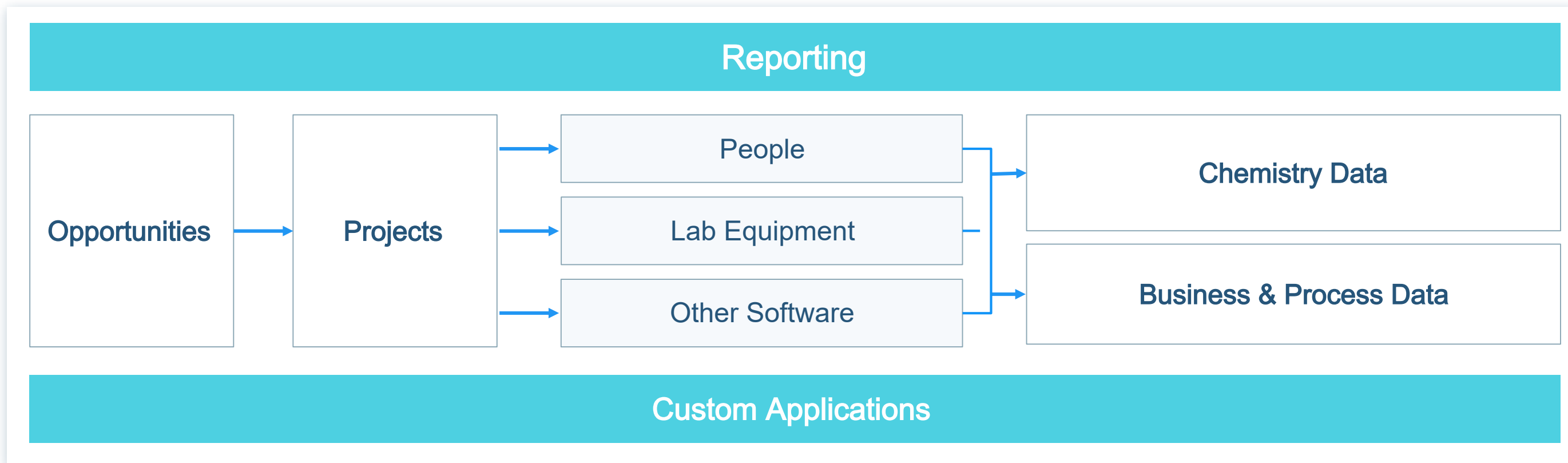
CANCEL **POST**

RM **Rodrigo Moreno** Nov 14, 2019
Hi Ladies - I can also join the meeting if you are interested in discussing my portion of the work.

CL **Chloe Leroy** Nov 13, 2019
Hi Dev @demo-lab3manager, just starting application testing now.

DM **Devlin Monroe** Nov 13, 2019
Hi Chloe @demo-lab3chemist2, please set up a meeting with me when done to discuss.

Manage your development activities holistically.



Usable Digital Knowledge Base

Data-Driven Decision Making

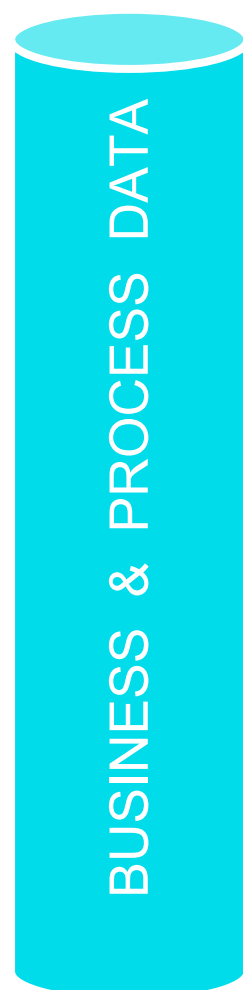
Automate Manual Tasks

Digital Best Practices

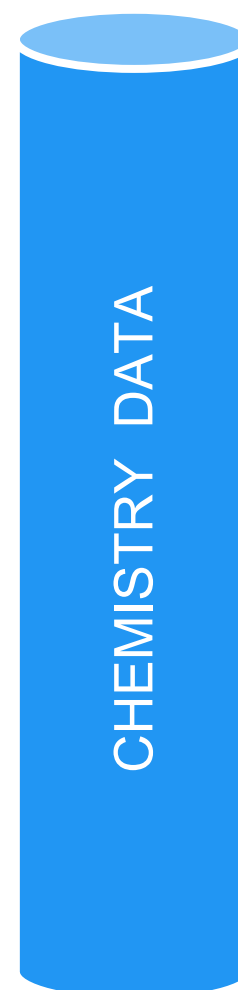
Process Optimization

Capture all the data generated during development and service delivery.

Unifying Data Model



- Library of Workflows
- Workflow Step Logic
- Approvals & Gates
- Opportunities / Projects
- Project Status
- Project Prioritization
- Project Costing
- Org. Structure
- Access Rights & Permissions
- Resource Allocation
- Resource Utilization



- Functional & Technical Objectives
- Chemical & Physical Requirements
- Chemical & Physical Properties
- Chemical Structures
- Chemical Formulas
- Recipes
- Products (including SDS's & TDS's)
- Test Approaches
- Test Results
- Analyses
- Conclusions

Realize measurable ROI.

Increase Speed

Accelerate innovation and speed up all commercialization-related business processes

OUR PROCESS TIMES
SHRANK
FROM 16 DAYS TO AN
AVERAGE OF **14 MINS**

Increase Capacity

Increase capacity of the lab by speeding turnaround time on all project work

OUR LAB **CAPACITY**
INCREASED BY **+30%**

Increase Sales

Increase conversion on new business by getting to accurate chemistry faster

CONVERSION ON OUR
CUSTOM WORK
INCREASED BY **+70%**

“Alchemy provides so much more than our old Biovia and Sharepoint systems. Alchemy makes it easy to track work across our core processes, so we can shorten individual steps and accelerate our time to market.”

- Jerry Powers
Product Development Manager
Chromaflo

Chromaflo accelerates time to market and responds to customers' technical service requests faster

- Technical service teams now track and manage thousands of color match requests, and related lab work, each year in Alchemy.
- All test and formulation data can now be filtered and searched to accelerate the process of hitting an exact match on future color requests.
- Automates calculations, process steps, and approvals to accelerate the end-to-end tech service process.
- Streamlined approvals process for custom formulation work cutting approvals from days to hours.





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