ADVANCED ANALYTICS SOLUTIONS' APPRENTICESHIP APPROACH

Structure of this Presentation

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Introductions: Advanced Analytics Solutions – The Partners

Mike Akers

- Quality Manager – Cummins
- Operations Director - Honeywell
- MBB Certified in 2000 (Honeywell)
- Lean Master
- Time served apprentice technician
- 18 years of Lean Six Sigma consulting
  - Rath & Strong, Accenture and SSA & Co
  - Author of "Exploring, Interpreting and Analysing Data with Minitab 18"
  - Trained several hundred GBs and BBs


David Hampton

- 20 years at Ford Motor Company
  - Manufacturing; Product Development; Sales & Marketing
- MBB Certified in 2001 (Ford Motor Company)
- 17 years of Lean Six Sigma consulting
  - Rath & Strong and SSA & Co
  - Led global accounts including Pfizer, Jaguar Land Rover
  - Author of a wide range of LSS training materials
  - Trained several hundred GBs and BBs and 40 MBBs
- Data Science Expert; trainer for RapidMiner

Exceptional experience in Lean Six Sigma training, coaching and consulting

Our Capabilities

We offer Operational Excellence training and consulting services both within and outside the UK Apprentice Standards

- Experienced practitioners who have advised multiple blue-chip companies and have delivered major programs in our own right
- We guide you through the key challenges – project selection, leadership engagement and driving culture change through the organisation

Operational Excellence Consulting

Apprentice Training

End Point Assessments
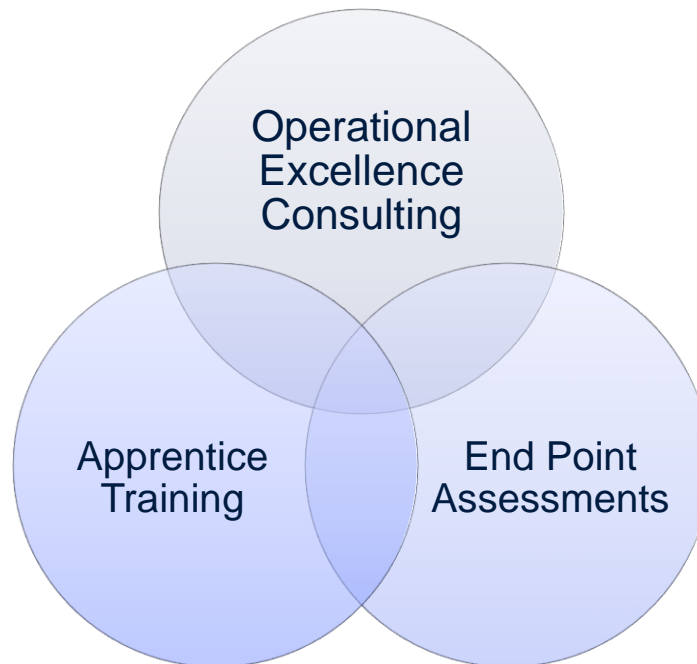
- The most experienced instructors of any Apprentice Training Provider: Master Black Belts of 10+ years' standing
- We always deliver results for the business as well as the Apprentice
- Extensive and customizable training materials
- Bespoke Data Analysis Toolkit makes the technical content easier

- We assess all Business Improvement Apprentice Standards: Improvement Technician, Improvement Practitioner, Improvement Specialist and Improvement Leader (we were the first organization to be authorized to offer all four standards)
- We also offer EPAs for ST070 Business Administrator

Our capabilities go far beyond the Apprentice Program – we advise you on what's right for your specific situation

Our Clients

Structure of this Presentation

Improvement Practitioner Training and Coaching Approach

Set an ambitious target; deliver business benefits; organise for success

Encourage apprentices to carry out two Lean Six Sigma projects
- "Green Belt" (GB) : a typical DMAIC (Define, Measure, Analyse, Improve, Control) project to fix an operational issue, lasting around 6 months
- "Lean Project": where time permits, carry out a project that reduces waste

Start on main GB project immediately
- Gain momentum
- Demonstrate business value to management

Where possible, start the Lean project after about 6 months
- Additional development opportunity for the best performers
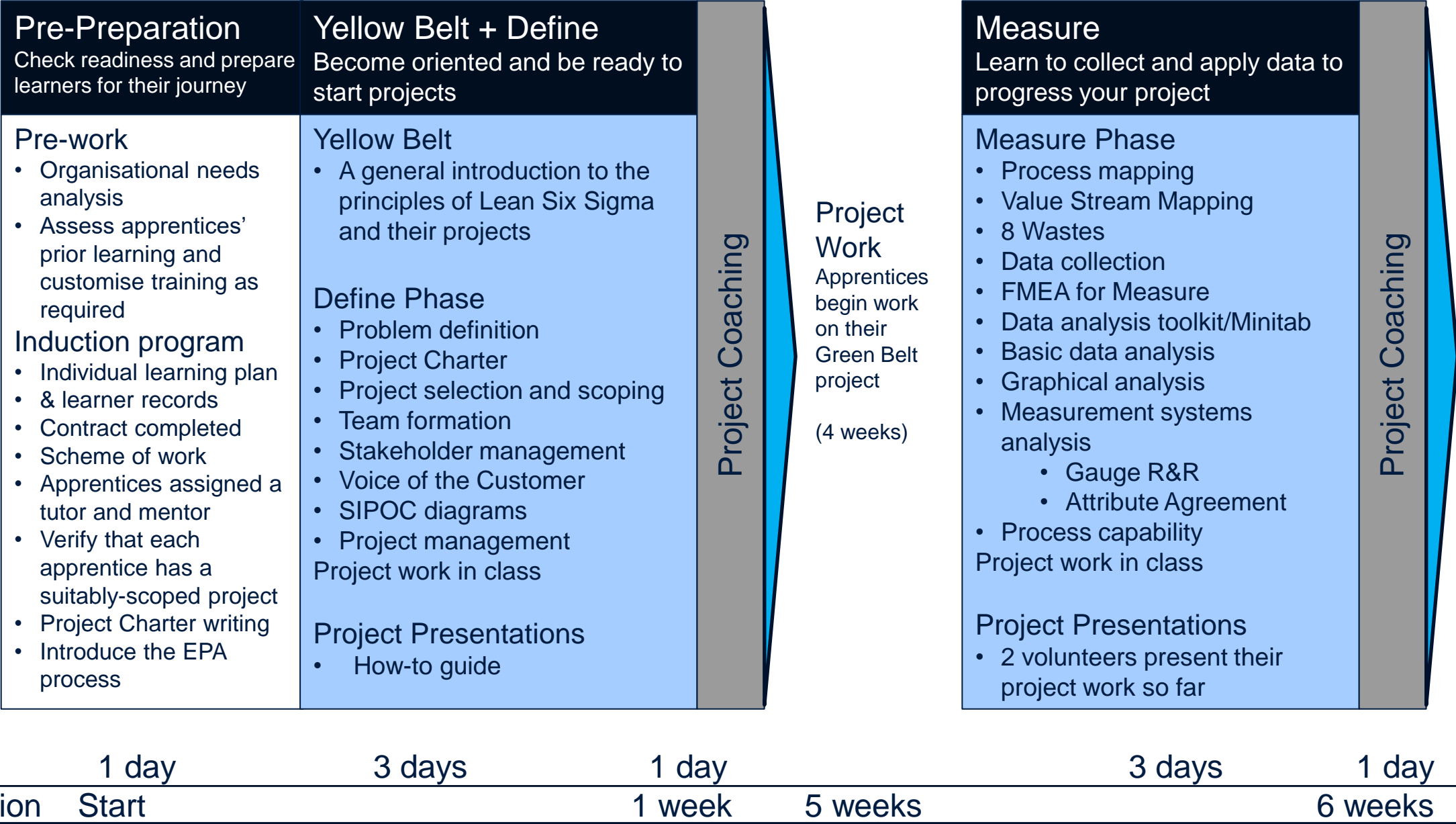- Allow time for slower Six Sigma projects to get finished

Improvement Practitioner Training and Coaching Approach

Deliver training in 2-3 day modules
- Better retention (brains get full)
- Fewer work distractions
- Easier to keep training in step with project progress

	Induction, Yellow Belt (YB) + Define	Measure	Analyse + Define Gateway	Improve + Measure Gateway	Control + Analyse Gateway	Remaining Gateways and Certification	
Training	3 days • Induct+YB: 2 day • Define: 1 day Includes project work	3 days Includes project work	2.5 days • Analyse	1.5 days • Improve	1 days • Control		**Total 11 days training**
Associated Coaching	After-class sessions as needed + 1 day workshop	After-class sessions as needed + 1 day workshop	After-class sessions as needed + 0.5 day Gateway + 1 day workshop	After-class sessions as needed + 0.5 day Gateway + 1 day workshop	After-class sessions as needed + 0.5 day Gateway + 1.5 day workshop	Improve Gateway • 2 days inc coaching Control+Lean G'way • 2 days including coaching Certification Event • 2 days including practice exam	**Total 15 days** F2F + after-class sessions + provision for 1 day remote

Plus 2 days provision for remote coaching as and when required (nobody is left to struggle)

Note: 15 days' coaching illustration is based on a cohort of 12 IPs. For smaller groups the total coaching time is reduced.

Details of Improvement Practitioner Training and Coaching Approach

Pre-Preparation
Check readiness and prepare learners for their journey

Pre-work
- Organisational needs analysis
- Assess apprentices' prior learning and customise training as required

Induction program
- Individual learning plan & learner records
- Contract completed
- Scheme of work
- Apprentices assigned a tutor and mentor
- Verify that each apprentice has a suitably-scoped project
- Project Charter writing
- Introduce the EPA process

Yellow Belt + Define
Become oriented and be ready to start projects

Yellow Belt
- A general introduction to the principles of Lean Six Sigma and their projects

Define Phase
- Problem definition
- Project Charter
- Project selection and scoping
- Team formation
- Stakeholder management
- Voice of the Customer
- SIPOC diagrams
- Project management

Project work in class

Project Presentations
- How-to guide

Project Coaching

Project Work
Apprentices begin work on their Green Belt project

(4 weeks)

Measure
Learn to collect and apply data to progress your project

Measure Phase
- Process mapping
- Value Stream Mapping
- 8 Wastes
- Data collection
- FMEA for Measure
- Data analysis toolkit/Minitab
- Basic data analysis
- Graphical analysis
- Measurement systems analysis
  - Gauge R&R
  - Attribute Agreement
- Process capability

Project work in class

Project Presentations
- 2 volunteers present their project work so far

Project Coaching

Duration	1 day	3 days	1 day		3 days	1 day
Cum. duration	Start		1 week	5 weeks		6 weeks

Details of Improvement Practitioner Training and Coaching Approach

Project Work
Apprentices continue work on their Green Belt project (4 weeks)

Analyse
Identify and confirm root causes

Analyse
- Cause and Effect Analysis
- Hypothesis Testing
  - Confidence intervals
  - P-values
  - T-tests/ANOVA
  - P-tests/Chi-Squared
- Regression

Project Presentations
- 2 volunteers present their project work so far

Define Gateway Review

Project Coaching

Project Work
Apprentices continue work on their Green Belt project (5 weeks)

Improve
Identify solutions to root causes

Improve
- Design of Experiments
  - Reducing the model
  - Prediction Eq'n
- Identify and prioritize improvements
- Benchmarking
- Future State Value Stream Map
- Change Management
- Lean improvement tools

Measure Gateway Review

Project Coaching

Project Work
Apprentices continue work on their Green Belt project (6 weeks)

Control
Embed the solutions

Control
- FMEA
- Control Plans for sustainability
- Standard Work
- Statistical Process Control
- Confirm business benefits

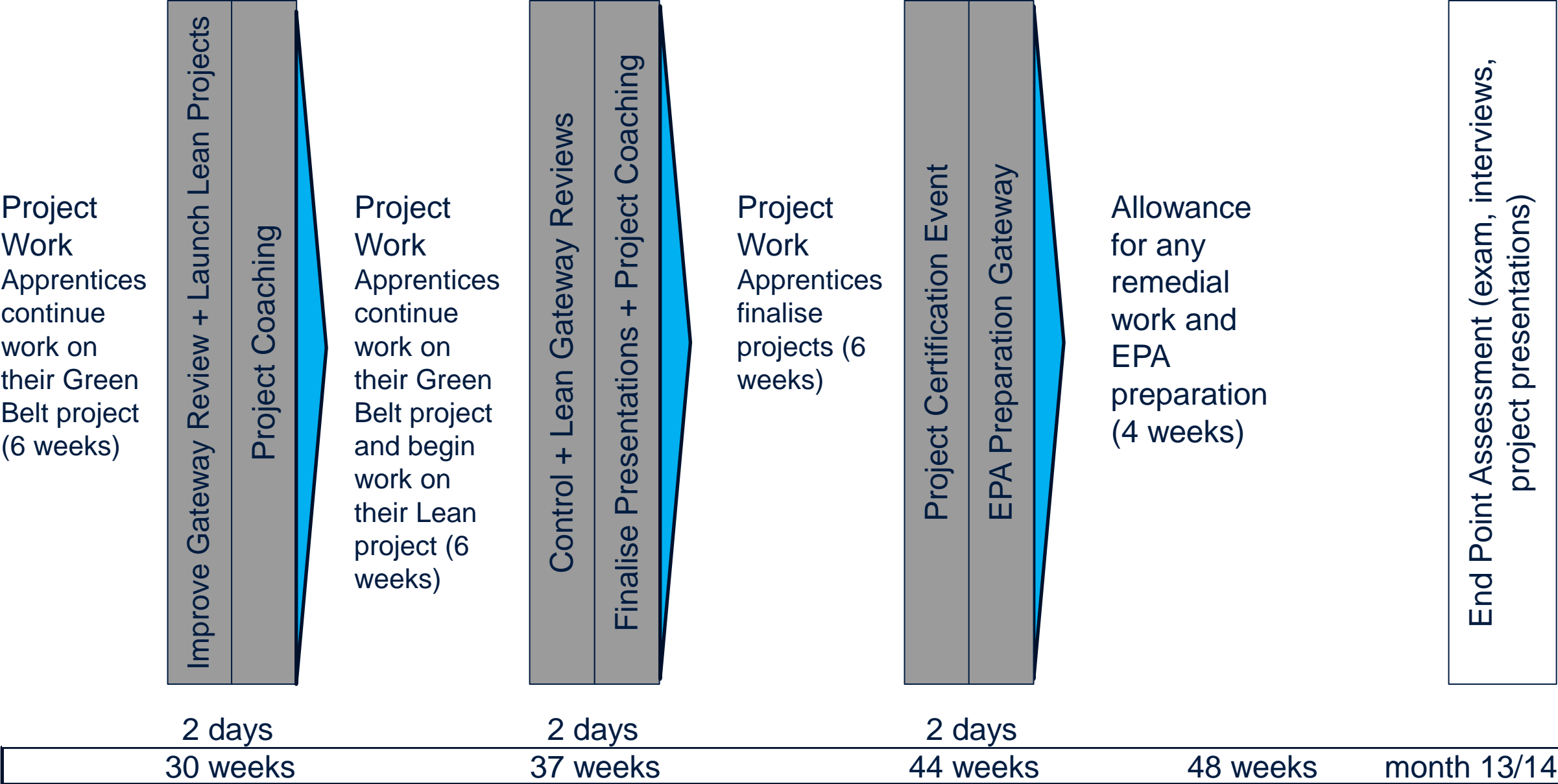**Analyse Gateway Review**

Project Coaching

2.5 days	1.5 days		1.5 days	1.5 days		1 day	2 days
10 weeks	11 weeks	16 weeks	17 weeks	23 weeks	24 weeks		

Details of Improvement Practitioner Training and Coaching Approach

Project Work Apprentices continue work on their Green Belt project (6 weeks)

Improve Gateway Review + Launch Lean Projects

Project Coaching

2 days

Project Work Apprentices continue work on their Green Belt project and begin work on their Lean project (6 weeks)

Control + Lean Gateway Reviews

Finalise Presentations + Project Coaching

2 days

Project Work Apprentices finalise projects (6 weeks)

Project Certification Event

EPA Preparation Gateway

2 days

Allowance for any remedial work and EPA preparation (4 weeks)

End Point Assessment (exam, interviews, project presentations)

| 30 weeks | 37 weeks | 44 weeks | 48 weeks | month 13/14 |

How the Coaching Works

Expert coaching in the execution of GB projects delivers:

Benefits to the business

Capability development for the apprentices

Our coaching approach:

Group coaching

Participants learn faster through seeing advice given on each others' projects

One-on-One coaching sessions

Attention focused on those most in need rather than forcing everyone through rubber-stamp exercises

Additional support as needed

1:1 After-class and provision for remote coaching

Our program assumes:

12 Improvement Practitioners per cohort

- Smaller groups will have slightly reduced coaching time – maintaining time per apprentice

13 days of scheduled face-to-face coaching

8 hours (1 day) of ad-hoc remote coaching

Structure of this Presentation

Management of the Apprenticeship Programme

- Organisational Needs Analysis will be completed with the named representative of the employer to identify training and business needs.

- Prior achievements of apprenticeships will be completed.

- Induction will take place: individual learning plan, Individual learners record , contract completed, scheme of work produced.

- Apprentices will be supported by a named tutor and mentor

- 20% off the job training will be established between all parties and this will be monitored throughout

- Apprentices will attend training and coaching days and complete work set

- Progress meetings will take place between the mentor, apprentice and the employer representative to confirm progress.

- Support will be offered throughout to ensure that the apprentice is gaining the correct level of skills

- The EPA process will be a smooth transition for the apprentice to ensure that they are able to complete their qualification.

The Apprenticeship Journey

1. Induction – All official paperwork will be completed, apprenticeships will understand the expectations of the programme.

2. Clear expectations- A clear understanding of how their role fits in with the programme, what tasks they will be completing and how to achieve high standards of work.

3. Review progress regularly – Ensure that the apprentice is getting the training and support that is needed and ensure that they are heading in the right direction.

4. Feedback- This will be tailored to each individual.

5. Autonomy of work- This will be encouraged and supported to enable the apprentice to gain high levels of job satisfaction and a sense of ownership over their work.

6. Mentor – Each apprentice will be assigned a mentor where they will receive appropriate support & guidance and progress meetings will take place.

7. Value added- Apprentices will retain high value on both economic and individual levels. They will be engaged and the projects will be individualised to their business objectives.

Structure of this Presentation

Summary

A successful apprentice program requires capability in two complementary areas:

- Training and coaching expertise
  - Deliver high-value projects for the business
  - Motivate and guide so that apprentices learn a valuable new skill set
- Apprentice program administration experience
  - Navigate the complex requirements of ESFA, Ofsted and the awarding bodies
  - Guide the apprentices to a successful completion of their qualification

Advanced Analytics Solutions is the best-placed UK firm, with in-depth capability in both areas.

- We use exclusively Master Black Belt tutors
- We were the first company authorised to End Point Assess at Level 5 and 6 due to our exceptional experience with Lean Six Sigma

	Success for the business	Success for the apprentice
Effective training and coaching	Project benefits delivery	Skill development
Effective program admin	Meet ESFA and Ofsted Requirements	Successful certification

Structure of this Presentation
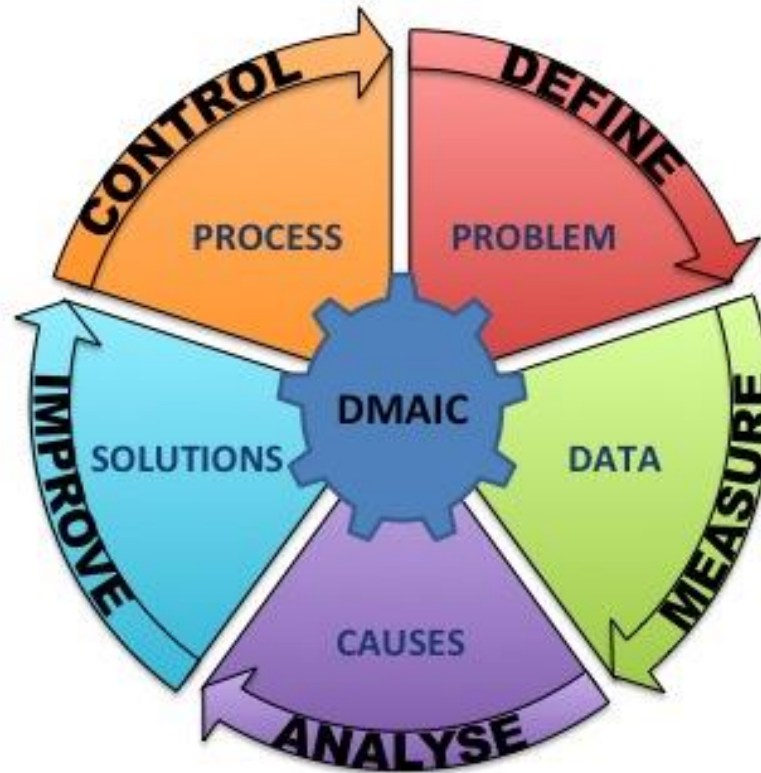
Enhance the Corporate Credit Cycle

PROJECT CHARTER, SIPOC & VOC
- Enhance the Corporate Credit Cycle

	Project Details
Project Description	Using Lean Six Sigma method with a team from within the business we will optimise the corporate lending cycle with the main focus on the time & resources required. This will include all the sub process steps and validation points for approval, focusing on the bottlenecks within the process.
Business Case	Competitive advantage enhancement due to improved customer satisfaction Optimium use of resources (reduction of xxFTEs) Gain additional business of EGPxxxx due to improved cycle time and improved customer service More efficient process by using Automated tools
Problem Statement	The standard corporate customer experience for approved funding (requested facilities) is a delayed process (greater than 60 business days) for approved funds for both new and existing customers. There are many approval stages with multi-page standard templates with miminal or no delegation. The

Slides omitted for brevity

Project: Enhance the Corporate Credit Cycle
Date: 3rd April 2017
Created by: MG & Team

Need	Drivers	CTQs	Metrics	Priority
		Number of documents	Less than 10 documents	3
	Quick internal process	Number of days	Less than 10 days	1
		Unified	Templates used	6
Fast & simple access to Funds	Clear & Concise requirements	Miminal	Number of additional documents by sector	4
		Speed of approvals	Less than 3 days	7
	Speed of Approval process	Number of approvers	Less than 4	2
		Delegation of approvals	Y/N	8
		Confirmations of conditions	Y/N	5
	Customer meets conditions	Number of days for filing documents	Less than 3 days	9

General → Specific
Hard to Measure → Easy to Measure

Project: Enhance the Corporate Credit Cycle
Date: 3rd April 2017
Created by: MG & Team

SUPPLIERS	INPUTS	PROCESS	OUTPUTS	CUSTOMERS
Customer	Customer Request	**Process Purpose:** To deliver approved fund to the customer	Funds	Customer
Customer	Financials		Decision	Customer
Customer	Documents	**Process Owner:** Head of Network, Head of Risk, Head of Operations, Head of Corporate Commercial	Documents	Relationship Manager Relationship Manager
Customer Strategy	Collaterals Procedures		Collaterals	Custody Customer
Bank	Templates Relationship Mgr		Cross Selling	Bank
Bank	Risk, Investigation, Back-office Credit centre/CIBD, CC members System Tools			Customer
Bank	Approvals			

Process Boundaries:
Start Initial contact with the customer — End Fund disbursment

Process Steps:
Application & collection of Documents → Investigation Report → Credit Study → Risk Study → Credit Committee Approval → Loan documentation fulfilment & Book the Fund

Stakeholders & Product Family & Conclusions

Stakeholder management plan

Project: Enhance the Corporate Credit Cycle
Date: 3rd April 2017
Created by: MG & Team

Role	Who (Names of people or groups)	How will they be affected?	How should we get them involved?	Notes
Team Member	Sub group from Strategy	Allocate time	Manger assigned	Training has been deliver on JIT
Sponsor		Review time & leadership support	Daily communication	Meeting to to arranged
Senior Managers		Need support of their staff to obtain process data and current process maps	Oveview session scheduled for Wednesday morning	
Line manager	Nominated representatives from Network, Risk, Operations, Corporate Commercial Banking, Credit Committee, Corporate and Investment Banking	Need support of their staff to obtain process data and current process maps	Oveview session scheduled for Wednesday morning	
Strategy Team	Non team members from Strategy group	Informed on process	Oveview session Monday morning	
Customers	Corporate Customers	Improved process	Communicate once process improved	At end of project
Other Stakeholder	Compliance Operational risk	Process change could affect risk	Communicate improvement and risk study share	

Product Family:
Reviewed the area of segmented product and found that for the Corporate Credit Cycle there is no significant difference in the process for
• Fund value
• New or existing customer
• Type of fund

Conclusions
• Large difference between customer need (10 days) and current business delivery (60 days)
• Manual paper driven process
• Process is spread over multiple locations
• Many approval cycles
• Document requirement is heavy at initiation
• Additional collateral required after approval

PROCESS MAPPING

Branch Process Map
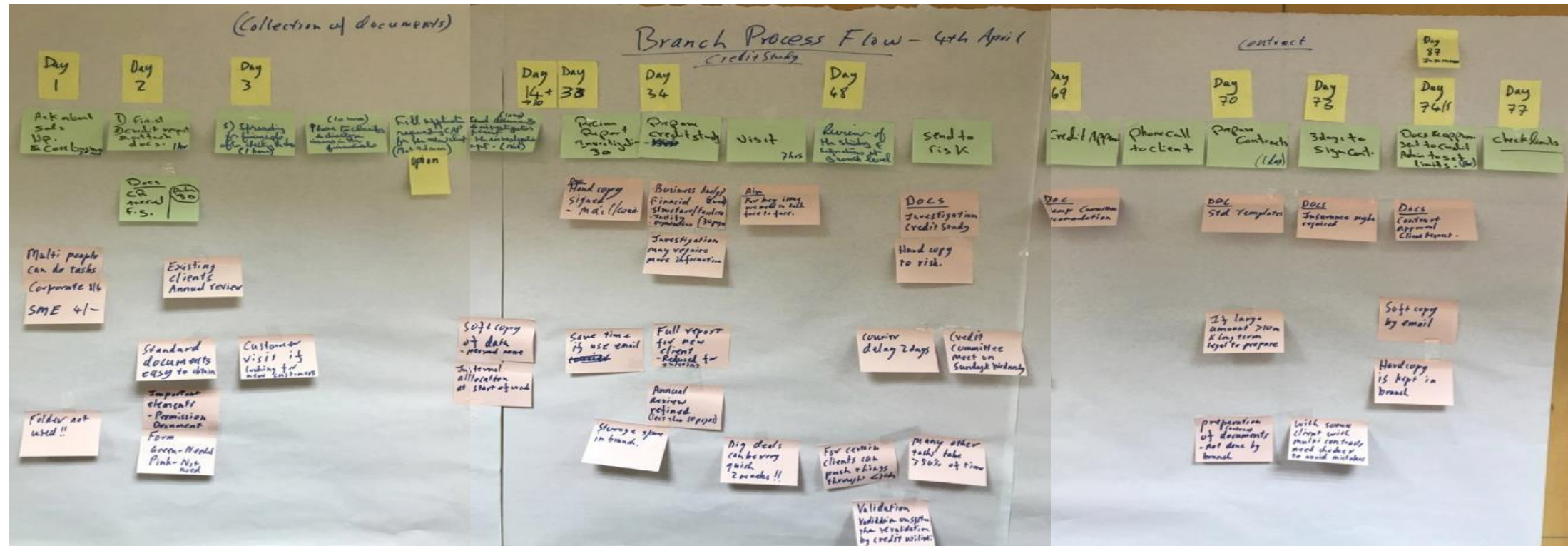
Observations

- Length of cycle
- Mix of paper and scanned documents
- Use of mail couriers
- Mixed locations
- No criteria or standard

- Different times for CPM
- Different paths
- Visit at start or middle
- Duplication of data
- Fields of form not used or folder!!
- No updates to customer on progress

Data Collection Plan

What questions do you want to answer?					
What is the current performance of the corporate credit cycle and find better practices and areas of concern					
Data		**Operational Definition and Procedures**			
What	Measure Type / Data Type	How measured?*	Related conditions to record**	Sampling notes	How/where recorded (attach form)
Cycle time of process		Sample files	End to End	10% initial to set sample size calculation	use standard Excel form
Number of approvals	Number of business days	Sample files	Actual Employees involved, amount		
Required Documents		Sample files	Document is as defined or addition required		Who
	Number of Approval				Core team
Current prepared stage reports	Number of documents	Sample files	Report as generated during stage		
Transfer time (stages)	Number of reports	Sample files/emails/ Risk's Excel sheets			
Total number of files/committee	Transfer time	Risk's Excel sheets	Attach out/in timing sheet to file		
Cycle time for each stage	Volume of requests	Sample files/emails/ Risk's Excel sheets	Approved files for 1 year & approval scales		
	Actual hours & minutes		Actual Employee involved, amount		
How will you ensure consistency?			What is your plan for starting data collection? (Attach details if necessary)		
Get team to measure the same files for each of the above measures and compare to see that the results are the same.			Tuesday 4th April until Thursday 20th April		
			For the timing sheets will need to add to the starting file and trainign will need to be given to ensure that the forms are correctly completed		
How will data be displayed (Sketch below)					
Time series plots, Boxplot plots, Histograms, Normality plots, Contol charts - IMR, Pareto					

1 **Good transactions**	**Defect free = 807**	
2 **Number of units**[1]	**N = 3276**	
3 **DPMO (PPM)**	**DPMO = 753663.0**	
4 **Yield**	**Yield = 24.63%**	
5 **Process Sigma**	**SIGMA = 0.81**	

Measure Conclusions

- Right First Time (RFT) performance low
  - Quality checks are not finding key errors & little use of Mistake Proofing
- Standards unclear or not enforced
- Templates not used or available
- Delays due to missing documents
- Same data presented several times in reports
- Reliance on paper
- Serial rather than parallel processing
- No End to End measurement of process performance

I Chart of Duration
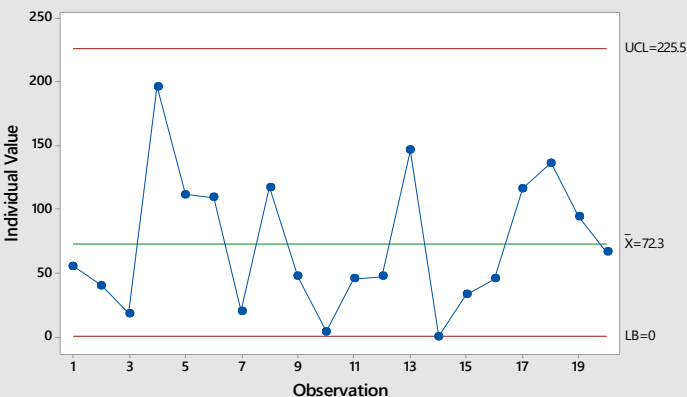
Scatterplot of Duration vs Value

24
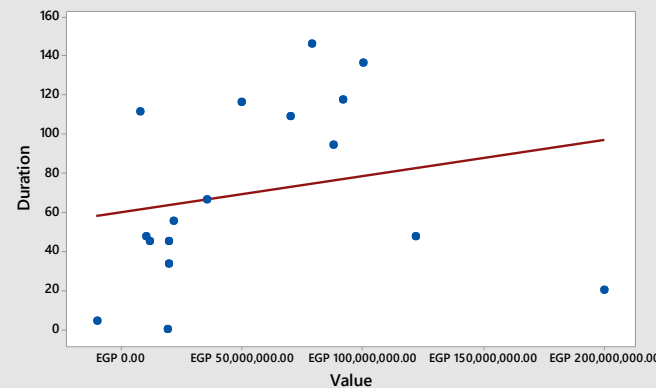
5 WHYS? & ROOT CAUSES SUMMARY

5 Whys

	1	2	3	4	5	5	5
Possible Cause	Knowledge level of employees/ Experience level low/	Missing documents due to errors, signatures, etc	High number of customer documents required	Not knowing the performance of the process	Lack of support checklists & model documents	Little use of Mistake proofing	Customers don't pass documents promptly
Why? Because	Training is based on managers view	Its is ok to send incomplete files	We are conservative so need all the documents	There is no tracking tool	Each person can create their own if they want to	Not a method that is discussed	We are not proactive so we wait until they are
Why? Because	No individualised development plans	Everyone has their own perspective	We are afraid that we might missing something that	The system works without one as its paper based	There is no one owner to set the standard		There is not regular followup with the customer
Why? Because	Not the business culture/strategy	There is no consequence of getting it wrong	We don't know what is really important to avoid default	The culture of the organisation	Each department owns their own way and		No due date is agreed for a file
Why? Because		We don't measure how well we are doing	We are not getting feedback on what is needed	We have not prioritised on the customers need for quick	There is no quality control		We don't think the customer will leave
Why? Because		We do not have a overall process owner	The process does not a a feedback loop	We don't think our performance	There is no model for each report		
ROOT CAUSE	Not the business culture/strategy	We do not have a overall process owner	The process does not a a feedback loop	We don't think our performance	There is no model for each report	Not a method that is discussed	We don't think the customer will leave

Root Causes Summary

#	Symptom	Root Cause	Priority	Responsible
1	Knowledge level of employees/ Experience level low/ Coaching of employees low	Not the business culture/strategy	1	N & M
2	Missing documents due to errors, signatures, etc	We do not have an overall process owner	2	N & F
3	High number of customer documents required	The process does not have a feedback loop	3	M
4	Not knowing the performance of the process	We don't think our performance will lose customers	4	N
5	Lack of support checklists & model documents	There is no model for each report	5	M & F
6	Little use of Mistake proofing	Not a method that is discussed	5	F
7	Customers don't pass documents promptly	We don't think the customer will leave	5	F

(slide omitted for brevity)

Analyse Conclusions

Cause & Effect Diagram id 36 possible root causes

Prioritisation Matrix tool these 36 were refined to a "top 5"

5 Whys used to find the final root causes

The solutions for the root causes will be developed in the Improve stage

ANALYSE Cause & Effect Diagram and Priority Matrix

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IMPROVE

PROPOSED PROCESS MAP

| Days | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | 0 | | 0 | | 0 | | 0 | 0 | 0 |
| Total days | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | | 1 | 1 | 1 |

| Process | Receive | Review | Internal Process I | Internal process II | Document | Market Sources | Banking Sources | Data - CT | Investigation | CPM - Exec | CPM - Facilities | CPM - Business | CPM - Financial | CPM - Projections | CPM - Banking | CPM - Risk | CPM - Justification | CPM - Recommendation | CPM - Attachments | Study | Reading | Report | Print | CC | CC | Send | Stamp | Notify |

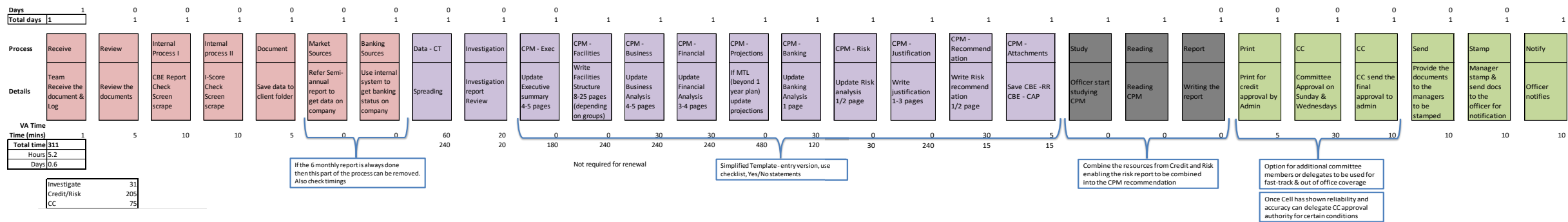| Details | Team Receive the document & Log | Review the documents | CBE Report Check Screen scrape | I-Score Check Screen scrape | Save data to client folder | Refer Semi-annual report to get data on company | Use internal system to get banking status on company | Spreading | Investigation report Review | Update Executive summary 4-5 pages | Write Facilities Structure 8-25 pages (depending on groups) | Update Business Analysis 4-5 pages | Update Financial Analysis 3-4 pages | If MTL (beyond 1 year plan) update projections | Update Banking Analysis 1 page | Update Risk analysis 1/2 page | Write justification 1-3 pages | Write Risk recommendation 1/2 page | Save CBE -RR CBE - CAP | Officer start studying CPM | Reading CPM | Writing the report | Print for credit approval by Admin | Committee Approval on Sunday & Wednesdays | CC send the final approval to admin | Provide the documents to the managers to be stamped | Manager stamp & send docs to the officer for notification | Officer notifies |

VA Time
Time (mins) 1   5   10   10   5   0   0   60   20   0   0   30   30   0   30   0   0   30   5   0   0   0   5   30   10   10   10   10

Total time	311					240	20	240	20	180	240	240	240	480	120	30	240	15	15
Hours	5.2
Days	0.6

Investigate	31
Credit/Risk	205
CC	75

If the 6 monthly report is always done then this part of the process can be removed. Also check timings

Not required for renewal

Simplified Template - entry version, use checklist, Yes/No statements

Combine the resources from Credit and Risk enabling the risk report to be combined into the CPM recommendation

Option for additional committee members or delegates to be used for fast-track & out of office coverage

Once Cell has shown reliability and accuracy can delegate CC approval authority for certain conditions

Recommendations

Implement P...

➢ Capabiliti...
  ▪ Credit course
➢ Performance Management:
  ▪ Missing Docs, Reviews, Resources, Insurance
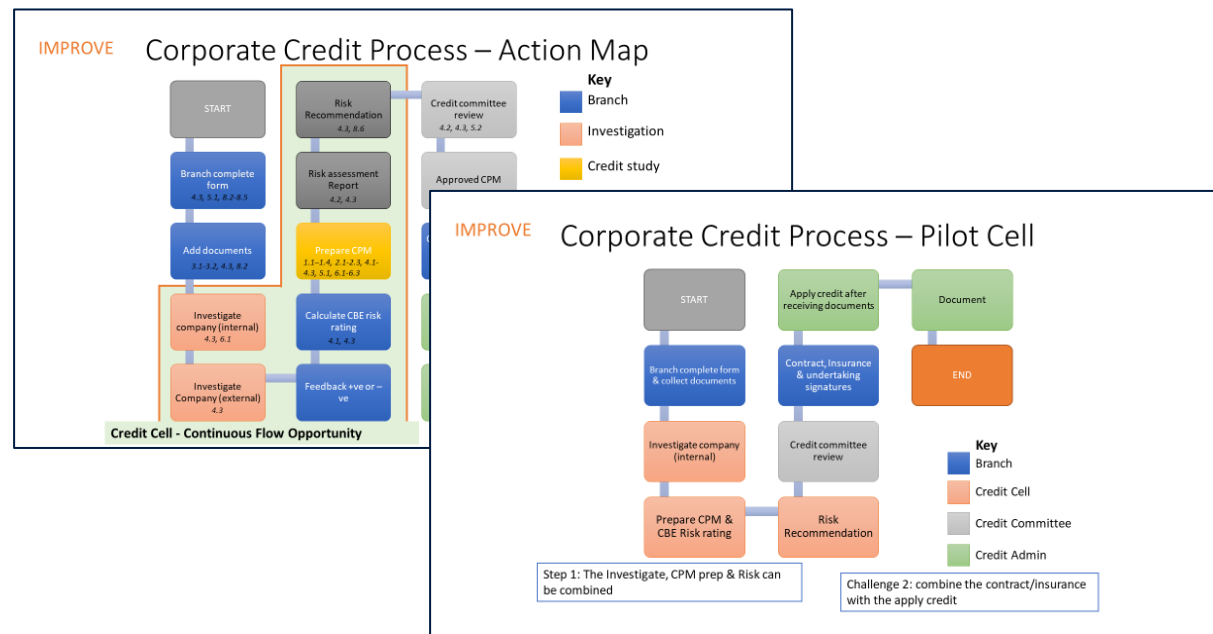➢ Checklists:
  ▪ Applications & folders

Initiate Renewals Cell
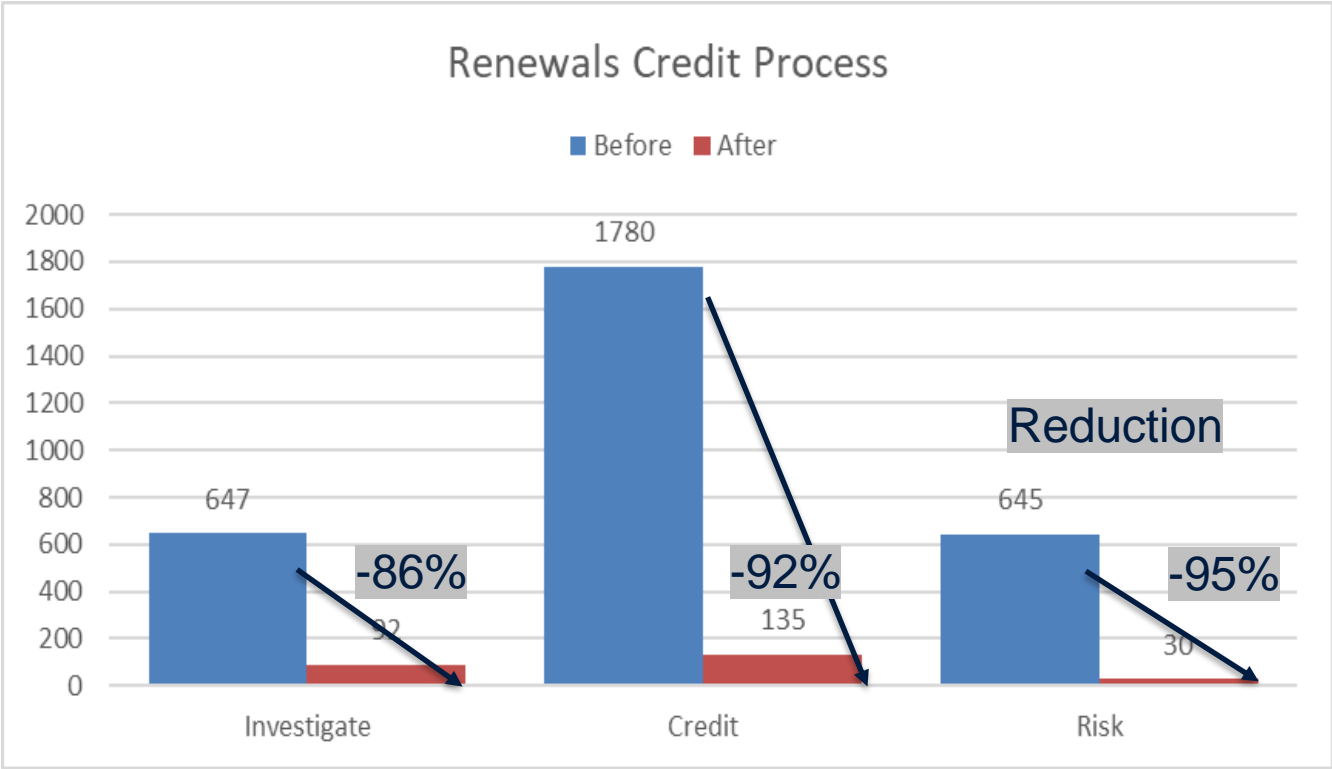
➢ Combine Investigation, Credit & Risk

Benefits

➢ Reduction in defects (>90% for missing documents)
➢ Productivity improvement (70% reduction in person-hours)

Slides omitted for brevity

IMPROVE Corporate Credit Process – Action Map

Key: Branch / Investigation / Credit study

START, Risk Recommendation 4.3, 8.6, Credit committee review 4.2, 4.3, 5.2, Branch complete form 4.3, 5.1, 8.2 8.5, Risk assessment Report 4.2, 4.3, Approved CPM, Add documents 3.1-3.2, 4.3, 8.2, Prepare CPM 1.1-1.4, 2.1-2.3, 4.1-4.3, 5.1, 6.1-6.3, Investigate company (internal) 4.3, 6.1, Calculate CBE risk rating 4.1, 4.3, Investigate Company (external) 4.3, Feedback +ve or –ve 4.3
Credit Cell - Continuous Flow Opportunity

IMPROVE Corporate Credit Process – Pilot Cell

START, Apply credit after receiving documents, Document, Branch complete form & collect documents, Contract, Insurance & undertaking signatures, END, Investigate company (internal), Credit committee review, Prepare CPM & CBE Risk rating, Risk Recommendation

Key: Branch / Credit Cell / Credit Committee / Credit Admin

Step 1: The Investigate, CPM prep & Risk can be combined

Challenge 2: combine the contract/insurance with the apply credit

CONTROL   CORPORATE CREDIT – BEFORE & AFTER

Difference & Time reduction of the standard process against the new process for Renewals

Renewals Credit Process — Before & After bar chart: Investigate (Before 647, After 92, -86%), Credit (Before 1780, After 135, -92%), Risk (Before 645, After 30, -95%)

CONTROL PLAN

Process Step	Unit of Measure	Who Will Record	How Often Recorded/ Where	Type Chart	What to Respond To	Who Responds	What Will They Do
Branch form	per unit	Officer	Weekly	i-chart	Form completed Out of limits	Manager	investigate
Company data	per application	Officer	Monthly	i-chart	Form completed Out of limits	Manager	Check for delays
CPM rating	number of pages	Officer	Monthly	i-chart	Out of limits	Manager	Remove duplicates
Contract	completed forms	Officer	Monthly	i-chart	Out of limits	Manager	Investigate
Committee review	Cycle time	Admin	Monthly	i-chart	Out of limits	Manager	Investigate

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