

General Topics – Easy Guides

**TANGRAM
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Easy Guide 1: Making yourself a project

1. Make a project now!

- What are you doing now?
- If it has time boundaries and measurable end products then it is a project!
- What is a good result from this project?
- What is a bad result from this project?
- What is a result that will get you noticed?

Define the results that you want and the results that will get you noticed. NOW!

2. Projects are about milestones and progress and testing

- What do you expect to complete in the next 5 days?
- What do you expect to complete in the next 10 days?
- When is the project going to be finished?
- You have just defined some important milestones for this project
- Can it be done better and quicker? Look for ways to reduce the time needed to finish the project.

Define the milestones and timescales. NOW!

3. Projects are about customers (internal and external)

- Who are your customers for this project?
- When and how did you find out what they wanted?
- When did you last talk to them?
- When did you last tell them how you were progressing?
- Progress reporting is not only saying what you have done, it is also saying what you haven't done!

Talk to your customers. NOW!

4. Make a 'Current Projects List'

- Make a list of the projects you are working on, this is your 'Current Projects List'.
- Your 'Current Projects List' is your life, your job and your CV!
- Projects = Measurable Things Done = Value Added = Recognition = Your Successes.
- Put your Current Projects List on display everywhere (especially where you and your boss can see it) and carry it with you!
- Review and score your projects in terms of Measurable Things Done, Value Added, Recognition and Success. Marks out of 10 for each category – you will only get better if you measure yourself against the best.

Make a 'Current Projects List'. NOW!

5. Make your 'Current Projects List' a transformation tool for you and the company

- Look for opportunities to transform the way you and the company work.

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- Look for opportunities to solve problems rather than work on the symptoms. Especially look for the 'unstated problems' that are often the 'root causes' of many symptoms.
- Use the Problem-Solving Tools (see Easy Guide No. 6) to find, define and solve problems.
- Write down how your work (your 'Completed Projects List') has improved and added value to the business.

HINT: If you can't write anything then start to worry and get to work on your current projects straight away.

HINT: If your job is still the same as last year then how much transformation have you created?

Write down how your 'Current Projects List' will transform and add value to the business (and you). NOW!

6. Projects are about being professional

- Was your last project the best you could do?
- Was it professional?
- Would you pay me to do it to this standard?

HINT: If the answer is 'no' then get better soon. Your company is paying you to do a job, that means you are a professional and if your standards are amateur then you won't be around for long.

Write down what are you going to do to get better. NOW!

7. Projects are about delivering results

- Did you deliver the goods (the results or the deliverables) at the end of the project? Were your customers delighted? If not, then why not?
- What were the definite things done?
- What went wrong? Score the project out of 100 (based on what a professional would achieve).
- What are you going to do to be better next time? You will only get better if you learn by your mistakes, but you will get better much quicker if you can also learn from the mistakes of others.
- You get no points for the projects that you start. You only get points for projects that you finish. Results and finished projects are all that count.

Don't wait. Do it NOW!

8. Projects are about priorities

- Which projects are urgent?
- Which projects are important?
- Which project adds the most value?
- Which projects are most important to your customers, company and boss?
- Which projects can you safely forget about?

Prioritise your 'Current Projects List'. NOW!

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Easy Guide 2: Overhead cost management

1. The general cost structures

- Manufacturing industry generally recovers the overheads by increasing the direct cost of the products by some factor. In the simplest form the total overhead cost for the company is divided by the total number of available direct labour hours (or machine hours) to give an 'overhead rate'.
- The overhead rate is multiplied by the number of direct labour hours (or machine hours) required for the individual product to give an overhead allocation.
- The overhead allocation, the cost of direct labour and the cost of direct materials are added up to give the 'cost' of the product.

2. Overhead costs are rising in relation to other costs.

- This type of costing method was developed when direct labour was a higher proportion of the costs and overheads were lower. Investment in machinery and services has reduced direct labour costs and simultaneously increased overhead costs but we still use the same old costing systems.
- Our efforts have not changed to reflect reality. The model we use is no longer valid.
- The older style cost accounting formulas are becoming even more inaccurate with time.

Cost Category	1960	1986	2006	2016
Overheads	15%	30%	35%	38%
Direct Labour	25%	12%	10%	8%
Direct Materials	60%	58%	55%	54%

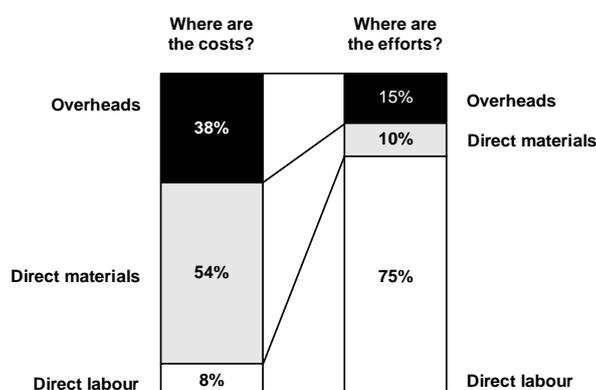
The changes in the cost categories with time

Note: These figures may not be exactly right for your company but direct labour costs are much less than overheads cost but we still use direct labour hours for cost allocations!

- Overhead costs are ripe for both change and management.

3. The management efforts

- Where do we currently allocate our efforts at cost reduction? The Work Study Department measures and controls direct labour, the Purchasing Department attempts to control direct materials purchases after the product has been designed and nobody controls the overhead costs.



The efforts at cost management

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4. The biggest costs have the least efforts to reduce them

- Labour costs are only about 8% of the cost of the product but the largest amount of effort goes into reducing labour in the process – 75% of the effort is in reducing labour costs and only 15% in reducing overhead costs. Our efforts are incorrectly focused because we are using a model sends us in the wrong direction when trying to manage costs.
- Reducing overheads by 10% gives a product cost reduction of about 3.5% – the same as a labour cost reduction of 35%. To save money then start with the big numbers where the big savings are. Whatever happened to Pareto analysis? (see Easy Guide 6).
- Realistic cost management is trying to understand what we are really doing. Unrealistic costing distorts reality so that good profitable products are killed whilst unprofitable products are produced.

5. What are the new rules?

- Cutting costs is not the same thing as becoming a low-cost producer.
- Cutting investment to reduce costs is a short-term measure.

Managing costs can make you a low-cost producer, simply cutting them will not!

6. The ABC's of accurate costing

- Cost accounting should reflect our activities and the efforts we use to make the product. It should manage the result rather than simply inform upper management of what happened months ago.
- Example: A business has overhead costs of £50K per year and deals with two products, both of which have sales of £1,000K per year and which take exactly the same amount of materials and working hours. The only difference is in the sales pattern: Product A sells 10 orders of £100K per year to one customer and Product B sells 1,000 orders per year of £1000 to 100 different customers. Convention says that the costs are distributed equally between the products and both accept an overhead of £25K per year even though Product B uses at least 100 times as much transaction effort as Product A. Convention over-prices Product A and under-prices Product B.
- Activity Based Costing (ABC) assigns overhead costs (or transaction costs) in more accurate proportions to the products that require them. ABC says that activities drive the overhead costs and are a sounder basis for allocating costs than any of the current methods.
- ABC looks at the 'cost drivers' and says that a global overhead figure from direct labour or machine hours cannot be used to work out product cost. The product cost is related to the activities necessary to get and produce the particular job (the 'cost drivers'). ABC requires more analysis but gives clearer understanding of what a product really costs. Without ABC the 'costs' used for pricing probably bear little relation to those that are actually incurred.
- ABC gives a clear allocation of overhead costs based on results and allows concentration on managing and reducing the transactions that drive the overheads and concentrate on results achieved – i.e., on effectiveness rather than efficiency.

It is totally useless being efficient at something that you shouldn't be doing!

7. What are the overheads that we can manage?

- ABC is a tool to focus on how overheads are generated, their value for money and allows us to reduce or eliminate those that do not generate value. The Pareto Principle tells us that 80% of the results in our business will be created by 20% of the activities. To improve overhead productivity, we must focus on and improve the vital 20% and cut or remove the trivial 80%?

To manage overheads, managers must accept that these costs are under their control and that they are not simply there to be allocated away and disappear!

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Easy Guide 3: Overhead Costs Hit List – Things to do Next

1. Manufacturing

- Do you have a full 'Manufacturing Plan'?
- There are only two activities that add value to the product, the rest add waste and cost. Are you adding waste and not value? Take the acid test – walk around your factory and check where people are being efficient at wasting money. Don't make it efficient – eliminate it!
- Value adding and waste activities:

ACTIVITY	ADDING VALUE	WASTE
Moving		✓
Storing		✓
Processing	✓	
Counting		✓
Inspecting		✓
Scrapping		✓
Re-working		
Assembling	✓	
Sorting		✓

- Are your manufacturing processes adding to your overheads by building waste and complexity into the process?
- Have you got absolute physical parts control? This is where parts have no chance to do anything but follow a controlled path through the manufacturing process, people cannot make a decision where parts go next and the next move for parts is physically controlled and restricted.
- Have you looked at the factory layout to decrease the need for product movements?
- Have you looked at introducing cell-based manufacturing to reduce line management?
- Have you identified your bottlenecks or constraints?
- Does your manufacturing staff have a clear idea of the overheads under their control?
- Have you looked at 'Design for Manufacture' to reduce component numbers and make assembly easier? 'If it can be taken apart then it wasn't put together properly in the first place'.
- Have you used 'Design for Manufacture' to decrease the need for support staff?
- Have you introduced component standardisation and reduced product variability?
- Have you measured the distance travelled in producing the product and reduced this by grouping product processes to give work cells?
- Have you measured the number of operations and total production time in minutes and reduced this (by combining operations) to give quicker flow and throughput?
- Do you use visual controls for performance measures? Monitor quickly, display rapidly and improve constantly.

2. Stocks

- Have you identified the hiding places for WIP and removed these to give clarity of work flow?
- Money tied up as stocks, inventory and work-in-progress should be included in the 'cost of production' but the accountants tend to treat them as assets.
- Have you reduced supplier order quantities with forward order for maximum discount and regular but smaller deliveries?
- Have you improved supplier delivery performance? Measure, monitor, score and tell them.

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Establish good relations to improve performance.

- Have you reduced stores holdings to hold only essential stocks in priority order?
- Have you looked at 'Stockless Production'?
- Have you reduced inventory (as stocks or WIP) in all areas? Stock is evil!
- Have you reduced set-up times (which drive Economic Batch Quantities, WIP and stocks) by methods such as Single Minute Exchange of Dies (SMED) at bottlenecks?
- Have you reduced paperwork at all stages to give rapid response?

3. Quality costs

- The ultimate overhead that should be reduced to reduce costs and improve customer satisfaction:
- Do you collect any of the standard Quality Cost information (there is a British Standard)?
- Get rid of inspectors. Make operators responsible for their own work and the quality of that work.
- Do you have any plans for reducing the cost of quality?
- Have you removed Quality Control (after the event) and substituted Quality Assurance (before the event) by using SPC or other techniques?

4. Staff overheads

- These are the support personnel costs of the activities that you carry out:
- Have you looked a Business Process Re-engineering (BPR) for the business activities?
- What is the ratio of indirect/support staff to direct production staff?
- Does new equipment reduce direct labour but increase indirect labour to support the machinery?
- Does new equipment really result in labour reductions? This is especially vital if direct labour reduction was used to justify the investment.
- Do you use performance measurement recording for administration processes as well as for production? If not then why not?
- Reduce order process time by simplifying or using computer systems. They are easily available.
- Do you really need all those layers of supervision? Reduce them to give direct and simple control.

5. Energy

- What were the bills last month and what did you do about them?
- Have you thought about and investigated competitive pricing for energy supplies?
- Have you thought about 'peak demand lopping' by internal generation?
- Is there any control over the usage of electricity?
- Are machine temperature settings optimised? You heat plastic up to process it and then it needs to be cooled down – energy can be wasted at both ends of the cycle.
- How does your processing energy usage (in kWh/kg) compare with the industry average?
- Only about 5% of the energy used at the compressor is available to do work at the point of use:
- Compressed air use can often be reduced by 30%.
- Have you carried out an energy audit?
- Do you have an energy management plan for the future?

Get the best use of your energy. NOW!

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6. Overhead cost management – Summary

- Overheads can be managed but we must accept that overheads are part of each manager's responsibility and provide the manager with the incentive and the information to reduce the costs.
- A manager should be held responsible for, and evaluated on, the costs that are under his control.
- Without overhead management, any attempt at cost management is bound to be both partial and inevitably ineffective. Effective cost management depends on the measurement and improvement of overhead productivity and will be one of the keys to success in the future. Ignore it at your peril!

Start to focus on overhead costs. NOW!

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Easy Guide 4: Materials cost management

1. Materials and the cost responsibilities

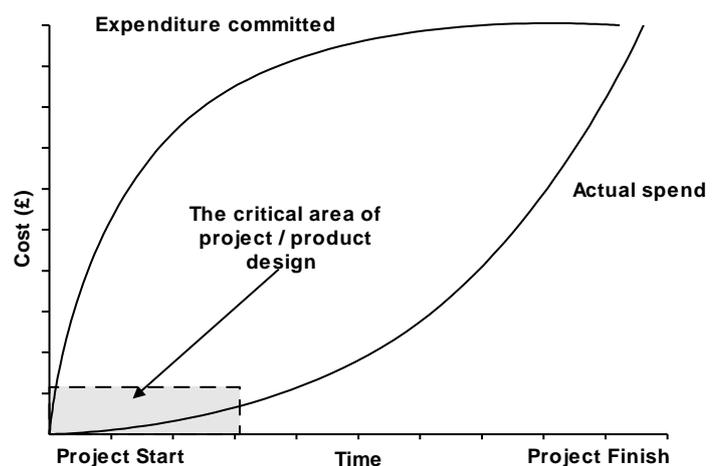
- Plastics processing is a conversion industry where we convert raw materials to a finished product. We rarely add much to the product in terms of additional items apart from the forming process. This means that direct materials are inevitably one of the largest cost elements of the finished products and yet it is one of the least attacked. Depending on the product, the raw materials cost element will vary from 45% (technical products) to 80% (mass produced products). Concentrate on this large cost element to get rapid and significant payback.
- So who is really responsible for materials costs?
 - Technical specifies the materials to meet the needs specified by sales
 - Production calculates how much material is required.
 - Purchasing negotiates a price within the specification and volume parameters.
 - Production tries to make the part and keep waste to a minimum.

The answer is that nobody is really in charge and everybody blames someone else.

This has got to change!

2. Design and materials cost reduction

- Designers influence product cost from the start. They take the basic decisions on the shape and design of the product. These 'simple and obvious' decisions (such as the type of material, the production method, the wall thickness and the rough outline dimensions) effectively define the overall cost of the product. Once you have decided the length, width, height, wall thickness and material type at least 80% of the product cost is bolted into place!
- The first 15 to 20% of the project time involves little actual spend but defines and commits 80 to 90% of the final product cost.



Expenditure committed and actual spend for a typical product.

- Care and innovation at the start of a project can dramatically reduce materials usage and product costs but there is almost always a rush to get past the critical first stage and onto the actual design. There are two simple reasons for this:
 - Product designers rarely understand the costing systems used and how their decisions affect the cost (or they are not interested or not told).
 - Accountants rarely understand the technical aspects of product design and how they can influence the design at an early stage rather than just calculating the cost after it is all finished (or they are not interested or not told).
- This is a recipe for disaster and for designs that use too much material and cost too much.

'We were late in starting the project so we had to make up the time somewhere'.

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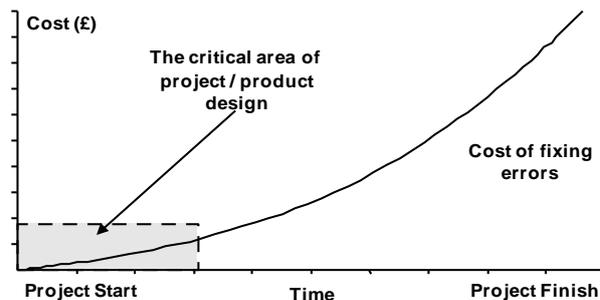
3. Product features

- Reduce the number of product features to meet the customer's needs. Get a clear brief from the customer on what they will pay for. Extra unwanted features generally increase the cost but do not increase the price the customer is prepared to pay.

Over-design is rarely free and adds costs that cannot be recovered in the price.

4. Getting it wrong

- Materials reduction efforts must be concentrated in the early part of the project to get the basics right.
- The cost of reducing materials content or making other changes to a design rises dramatically as a project proceeds. Changes in the early stages are relatively easy to carry out but the cost rises rapidly as actual expenditure takes place.
- Care and innovation at the start of a project reduces the changes necessary and the costs of development.



The cost of getting it wrong during product development.

Get it wrong and your materials costs will be built into the product for life!

5. Design for manufacture

- Designers must be trained in 'Design for Manufacture' and the principles of economic product design.
- Designers and production staff must be trained in 'Design for Assembly' to reduce part count and total materials content.
- Least number of parts = least amount of materials.
Least number of parts = least number of assembly operations.

Design for the most economic method of meeting the brief.

6. Current products and materials cost reduction

- Form a Materials Team to look at products in current production.
- Strip down competitor's products and cost every material and production step. Look for areas to reduce cost.
- Use the Value Analysis/Value Engineering techniques to build a cost-benefit table for every feature of the design.
- Retooling – It is rare to retool for materials cost reduction but sometimes even this 'unthinkable' option is profitable over a short time scale – do the calculations if in doubt. When a replacement tool is needed for other reasons, it is logical to consider materials cost reductions at the same time.
- Scrap reduction – Scrap (with the exception of a small amount of start-up scrap) is generally the result of inadequate production control and is an opportunity for materials cost reduction. Scrap, even when reused, has consumed time, power, effort and has created unnecessary costs in the business.

Current products must be ruthlessly examined for every materials cost reduction idea possible.

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Easy Guide 5: Materials Costs Hit List – Things to do Next

1. Materials cost reduction

Materials cost is one of the largest costs in plastics processing but there are few formal attempts to manage this cost in many processors. Attempts generally involve simply reporting 'variances to standard' without any real attempt to reduce the absolute usage. This 'Hit List' gives some suggestions for actions to reduce the real total spend.

2. The materials team

- Set up a 'Materials Team' (to include Sales, Design, Purchasing, Production and Accounts) to ensure that all materials are used cost-effectively. A 1% reduction in purchasing spend has the same effect on profit as a 10% increase in sales volume!
- Consider using an outsider (with no vested interests or history) to drive the programme.
- Provide the Materials Team with accounting information to allow them to do their job.
- Allow the Materials Team freedom of action to change anything and everything! This includes the product design, the raw materials and the manufacturing process. Nothing should be off-limits in materials cost reduction.
- Use Pareto analysis to look for targets.
- Compare competitive products, strip them down and look for every cost saving – each one may be small but the total can be amazing.
- Use value analysis for product assessment and cost reduction strategies. Value analysis needs open accounting information to be effective and to provide the focus for the cost reduction efforts.
- Start to set up the 'measures of effective performance' for the team.

Set aggressive targets in materials reduction – 10% off the total materials bill should force them to think radically!

3. Accounting

- When materials represent between 45 and 80% of the cost there is a lot more to do than simply report the variances!
- Produce detailed breakdowns of all materials cost components. Identify the real cost of every finish, operation and special feature. Go for the big costs first and use Pareto (see Easy Guide 6).
- The Materials Team must justify every cost component or eliminate it!
- Is the discussion really about 'Make or Buy'?

Accounting holds the key to materials cost reduction!

4. Sales

- Always develop the Product Design Brief with the customer – full information before design starts can be used to reduce product cost dramatically.
- Specify new product requirements in terms of functions and NOT in terms of materials.
- If a product feature adds cost or extra parts but justifies no extra margin then eliminate it.

Sales have a vital part to play in materials reduction – they have got to sell the result!

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5. Design

- Provide a full Product Design Brief, including essential and desirable features, to designers and the Materials Team. Specification should be functional not materials based.
- All product designs must have a 'materials design and usage review' before they are signed off.
- Always question the wall thickness!
- Look for ways to remove material by using good design principles – look at disposable razors to see how stiffness can be created by good design.
- Always question why they didn't use a 'stock' part. The first PC's were put together by IBM from stock parts! This even included the operating system from Microsoft – the start of their fortune. This includes stock materials and finishes. The use of standard parts has a huge payback
- Always question why they didn't use a cheaper part. The worst that will happen is that they will justify why they used the more expensive part. The best is that you can save on the part cost.
- Train designers in Project Management and Design for Assembly.
- Ruthlessly prune out 'over-designed' product features.

Designing materials out of the product is easiest at the design stage.

6. Production

- Create set-up sheets for all products, keep them up-to-date and use them.
- Use Taguchi methods to find the optimum set-up parameters and feed these into the set-up sheets.
- Use Statistical Process Control on every product to start to reduce materials content.
- Make changing process settings without written approval a dismissible offence. If you think this is harsh then think how the MD would react if a process operator let the air out of his car tyres 'because I thought the car would run better'. Fiddling with process controls costs more in terms of scrap and wasted materials than you would ever believe. Stop it NOW!
- Reduce set-up times to reduce Economic Batch Quantities and produce to order rather than for stock. Don't convert raw materials to products until you have to!
- Scrap (with the exception of a small amount at start-up) is generally the result of inadequate production control and is an opportunity for materials cost reduction. One of my favourite quotes is 'We don't have any scrap because anything that is not right is reground and the material is used again'. Scrap, even when recycled, has consumed time, power, effort and has created unnecessary costs in the business.

Production is where the material is actually used!

7. Purchasing

- Give purchasing the flexibility to get the best deal and get them involved with the Materials Team at the start to advise on the cost implications of every action.
- Clearly communicate delivery & quality standards to all suppliers.
- Consider blanket orders to reduce transaction costs.
- Look at e-commerce to reduce transaction costs.
- Consider frequent deliveries with no inspection and buffer stocks for strategic items only.
- Can you buy 'consignment' stock?

Purchasing must control the contractual arrangements for all materials used!

8. Suppliers

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- Drastically reduce the number of suppliers and consider 'single sourcing'. Involve those that remain in the Materials Team. Use Pareto analysis (see Easy Guide 6) when reducing your supplier base
- Jointly target cost reduction areas with your suppliers. If they don't want to do this with you then consider other suppliers.
- Start to develop your suppliers as part of your strengths.
- Get suppliers to package ready for production – think about KANBAN containers.
- Minimum stocks and no inspection on delivery – ship direct to shop floor.
- Future requirements discussed at global level.

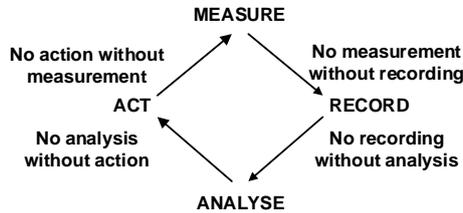
Building supplier relationships to reduce cost needs perseverance and time.

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Easy Guide 6: The problem-solving toolkit

1. The problem-solving action cycle

- The action cycle provides a method for controlling the problem-solving process.



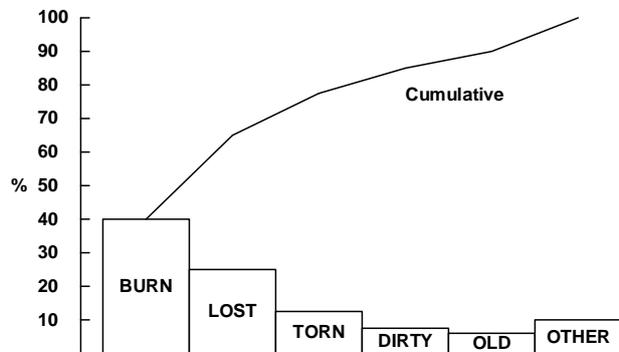
- Problem solving without a method is random and doomed to failure. The only exercise you will get is jumping to conclusions!
- The cycle is repeated as often as is required.

•

Always follow the action cycle!

2. Pareto principle (80:20 Rule)

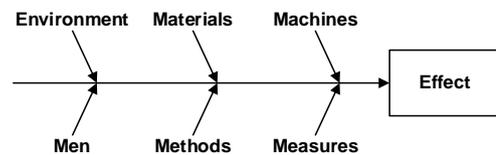
- Separate the vital few from the trivial many.
- Group the data into logical categories with largest category first and 'Other' last.
- Plot the cumulative result.



Start work on the vital few first!

2. Cause and effect

- Identify potential causes and areas to start work.
- Use with operators not managers. They know the real process.
- Get all the causes and then rank using Pareto.

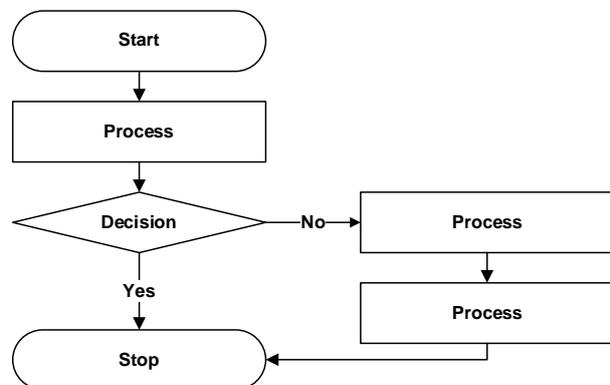


Solve the cause, don't just treat the effect!

3. Flow charts

- Map the actual process.
- Find the decision points and areas of confusion.
- Improve the process to meet the ideal.

If a process cannot be made into a flow chart it will not work!

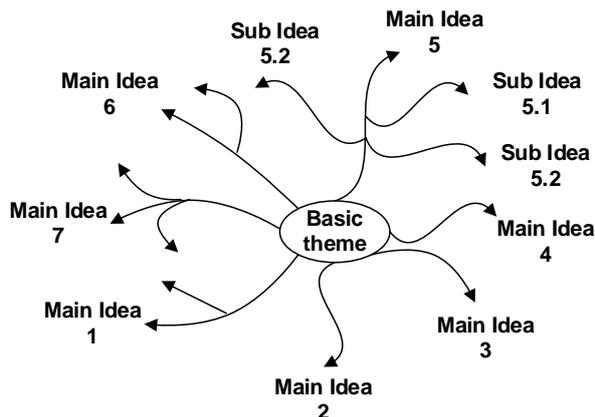


General Topics – Easy Guides

4. Mind maps

- Get all of your ideas down, small notes only.
- Organise by Main Ideas first.
- Do not try to prioritise or number when mapping. Get it down on paper first.
- Look for relationships. Let one note spark another.

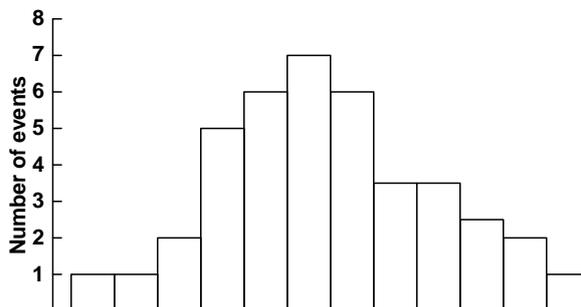
Get the ideas down on to paper.



5. Histograms

- Get lots of numbers in an easily understood visual form.
- Group the numbers into cells or ranges.
- Plot to give a histogram, look for the average and the shape (distribution).

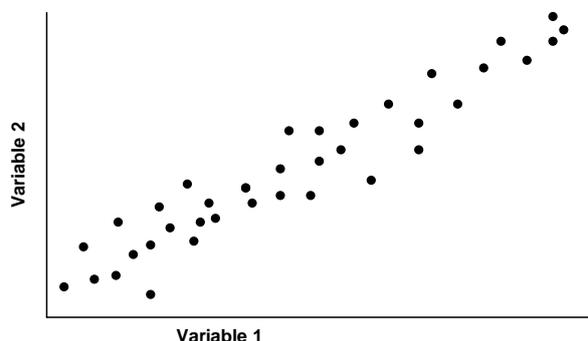
Easy to understand and decide on action.



6. Scatter charts

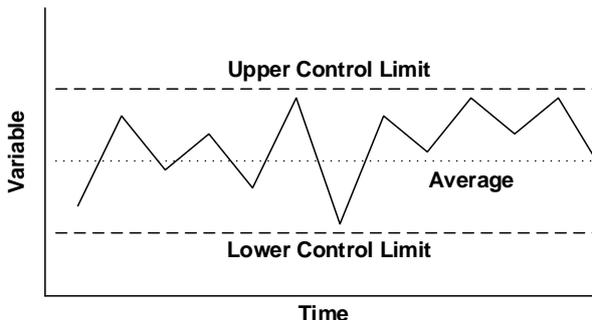
- Quickly see if two variables are related.
- Go for quick and dirty numbers.
- Correlation is not causality. A relationship does not indicate a direct connection only that Variable 1 influences Variable 2 – there may be a deeper connection.

Find the relationship quickly!



7. Run Charts and Control Charts

- Good way to show data over time.
- Collect data over time. Look for the average.
- Consider the moving average for rapidly changing results.
- Set control limits for upper and lower boundaries.
- Look for 'out of control' patterns. Points outside control limits, runs up or down, points always under or over the average value.



Control charts let you look forward rather than backward. Prevention is better than detection.

General Topics – Easy Guides

Easy Guide 7: Managing your boss

(Management goes up as well as down – Make your work easier!)

Everybody talks about 'leadership training' and how important it is to be a good manager and leader. The truth is that most of our time is spent as 'followers' and nobody is ever trained to be an 'effective follower'.

Being an effective follower is different to being an effective leader but you need both skills for survival.

1. Bosses:

- Have more status, more experience, more resources and more power.
- Depend on their staff (Don't have dog and bark yourself).
- Need information. You should report on progress and non-progress. Both are important.

2. You:

- Have a better detailed understanding of the job, more up-to-date information and better customer contact, easier access to the team, information and data (not the same thing!).
- Depend on your boss for security and survival – if your face ceases to fit it can be very uncomfortable.
- Have access to power because real power is taken, never given.

3. Understand your boss and their needs

- What are their goals and objectives (both stated and unstated)?
- What are the pressures on them?
- What are their strengths and weaknesses?
- What is their personal work style – autocrat, democrat, indecisive?

What you do not understand you cannot manage. Analyse your boss. NOW!

4. Understand yourself and your needs

- What are your goals and objectives (both stated and unstated)?
- What are your strengths and weaknesses?
- What is your personal work style and do you resist or depend on authority?

What you do not understand you cannot manage. Analyse yourself. NOW!

5. Develop the relationship

- Ask how you can make it easy and more relaxed for them – it is always better than guessing!
- Does it fit both your needs and styles and mutual expectations? Is it a formal relationship (written reports, memos, formal agendas for meetings, regimented hours) or an informal relationship (verbal reports, notes, unstructured, flexible hours)?
- Identify the expectations. What is a good or bad performance from you?
- Minimise your use of the boss's time and resources.

Management is about relationships. Define the relationship, start to build it and manage it. NOW!

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6. Set realistic expectations

- Clearly identify their expectations of you.
- Never accept unrealistic expectations – this is programming yourself to fail. Identify the things you cannot do at the start and state plainly that the expectations are too high. Doing this at the start is painful but rest assured it will only get worse the longer you delay it.
- Get them to define what they want. If in doubt then do an outline and get them to approve it – it is easier than doing a whole load of work and then finding out that you were headed in the wrong direction!

Set realistic, achievable and mutually agreed expectations. NOW!

7. Win their support

- Establish a human context for relaxed conversations. Get comfortable with your boss so that you can say the tough things when the time is right. No gossip ever.
- Be willing to share the credit for new ideas and work. They can take it from you anyway if they want to.
- Review projects together regularly. Tell the boss quickly about any concerns and agree what action to take. Keep them informed – bosses hate bad surprises but most can live with pleasant surprises.
- Set small goals and meet them. Win small battles to show that you can do it. Get a reputation as a winner and build on it. Boost their confidence in you and your work

Start to build his support by earning it. NOW!

8. Independent work – the pleasurable surprise

- Most people allow their day-to-day work take up 100% of their time. They will never be stars.
- Stars will develop methods to compress their day-to-day work into 80% of their time. This releases 20% of their time for independent star work (not to simply relax).
- Pick a small project, develop the idea (without committing too much money) take the idea through to completion and ready to launch.
- Take the completed project to your boss and ask them to sign it off. Your boss now has a pleasant surprise in the form of a completed project – You too can be a star!

Decide on a small project for yourself. Don't wait. Do it NOW!

9. A4 Pages

- All bosses want solutions not a long rambling open-ended discussion about a problem.
- Define the problem in less than 3 paragraphs on an A4 page and present your recommended solution in a final paragraph.
- Give it your boss and ask them to approve it and sign the bottom.
- They get solutions not problems. You get approval to proceed and the solution that you wanted. 'Win-Win'.

Prepare some A4 sheets and try it. NOW!

10. The bosses from Hell

- Believe in power and responsibility – they have the power; you have the responsibility!
- Take all the credit (when done) and even worse they

Leave quickly, it is easier, quicker and less painful. NOW!

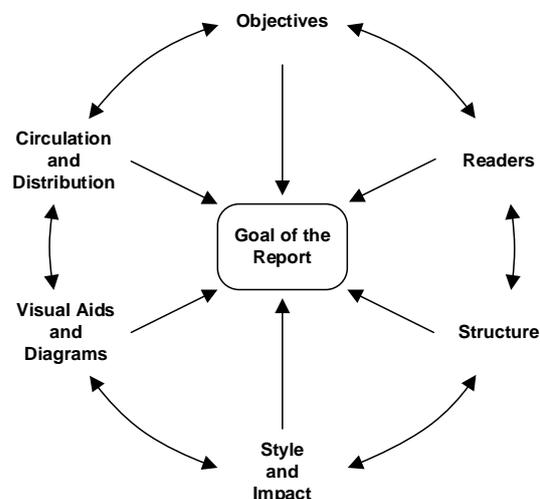
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Easy Guide 8: Report writing

(All the information that's fit to print or that fits the print?)

1. Before you start

- Every report needs to add value to the company and you – otherwise it is not worth the effort of writing!
- A report is a working document that achieves specified objectives.
- The report model shows the important factors in writing any report and these must be considered before you put pen to paper.
- If you forget any of the factors in the model you will end up taking too long to produce a report that will be inadequate and ineffective in any case.



2. The first steps – planning

- A first mistake is to assume that you know what the person who asked for the report wants. Often, they do not know what they want themselves. They will never hesitate to tell you that what you have written is not what they want!
- Before starting insist on a thorough briefing from the person who requested the report and identify:
 - the purpose of the report?
 - the need for the report?
 - who is going to read the report?
 - the scope of the report?
- If they cannot, or will not, provide a briefing then do a Mind Map (see Easy Guide 6) for the topic and produce an outline of what you intend to cover. Get this approved before you write anything!
- Make a Mind Map for the report (see Easy Guide 6).
- Use the Mind Map to identify the information you need, make notes and collect the information. Select only the facts which are relevant to the objectives and the reader. Check the facts.
- Use the Mind Map to start to plan the topics AND the links between the topics.
- Be absolutely clear in your plan what you are going to say and how you will say it.
- Remember: Logical, truthful, helpful and to the point.

Get the first steps right and the rest is easy!

3. Objectives

- Decide what you want the report to achieve. Write to achieve that and only that.
- Identify your readers, their motivations, needs and concerns.
- Identify what your readers need to do to help you to achieve your objectives.
- Write your objectives and reader profile on a 'Post-It' and put it where you will see it as you write. 'The Economy – Stupid' was written in huge letters in Bill Clinton's campaign offices!

Knowing what you want is halfway to getting it!

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4. Readers

Focus on:

- The reader's needs and concerns.
- The reader's level of knowledge and technical expertise.
- The reader's openness to new ideas.

Check:

- Will the readers easily understand what you have written? Have you used any technical or scientific words unknown to the readers?

Define your audience and write for them, not for yourself!

5. Structure

Focus on:

- The beginnings and endings of reports – these are what busy people notice most!
- Putting action points near the beginning or at the end.
- Signposting by using meaningful headings. The reader should know exactly what will happen next. Important points should stand out clearly.
- Use an 'Executive Summary' written in simple language.
- Information will not be read in the order you write it. Place essential information either at the top or the bottom of the page with the less important information in the middle paragraphs.

Check:

- Have you clearly stated your conclusions and recommendations?

Structure the report for the audience!

6. Style and impact

Focus on:

- Using only straightforward, uncluttered English. Use short sentences, short words, and simple sentence construction to give accuracy, brevity and clarity.
- Every word must serve a useful purpose and must be spelt correctly. Read the final copy and get someone else to read the draft – never trust a spell-checker.
- Using active verbs and concrete nouns to give a positive 'feel' to the report?
- Avoid using vague phrases and jargon, slant and bias and 'business English'.

Check:

- Compliance with the company standard?
- Does the report look good and can it be reproduced using the available equipment?

Style can make the difference!

7. Visual aids and diagrams

Focus on:

- Using enough visual aids to improve understanding.
- Getting visual aids in the right place, clearly labelled and cross-referenced.

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Check:

- Are scales, units, dimensions and magnification consistent and shown on every visual aid?
- Will the visual aids still be clear when reproduced?

A picture is worth a thousand words!

8. Circulation and distribution

- Is everybody who 'needs to know' on the circulation list?
- Is the circulation too wide?
- Have you arranged for spare copies?

Make sure that all the right people get the 'fruits of your labours'.

General Topics – Easy Guides

Easy Guide 9: Effective recruitment

(Round pegs for round holes)

1. The costs of staff turnover are higher than you think, some of the costs are:

- Recruitment costs – The cost of the recruitment process will vary but a budget of 10% to 15% of the employee's annual salary should be allowed. This includes agency and advertising costs, staff costs for the process and all the other hidden costs in the process.
- Training costs – A new starter costs money in training before they actually contribute. The costs are both for any formal skills training and those of the other staff who have to provide assistance.
- Efficiency costs – It takes many months for any new employee to become fully productive and effective. It normally takes 3 months to find out where the paper clips are stored!

The total costs of recruitment can be anything up to 50% of the employee's salary; it is worthwhile making sure that you don't have to do it too often!

2. Steps to recruitment:

- Advertising – Getting the advertisement right is the first step:
 - An accurate job title is essential.
 - The advertisement has to 'sell' the job and its good points.
 - Get the right paper or journal, not many Finance Directors read 'New Scientist'!
 - Your customers and other staff also see a job advertisement. Make sure it says the right things about your company.
- Agencies and head-hunters – You know what you are looking for in a candidate. Agencies must also know otherwise they cannot put the right people in front of you. Agencies will give you what they have on their books but are useful for reducing the workload of initial responses. Head-hunters are for when you want to keep it quiet, the initial expenses are high but for the right person they can be very effective.
- CV – Use the CV to sort for interview, not to select for the job. Go for the person not the paper!
- Testing – Psychometrics and other tests (graphology?) can be useful but need expert analysis and there is no substitute for incorporating real work into the testing process e.g., 'in-tray' exercises.
- References – These are widely used but would you submit a written reference that was not glowing or include the name of somebody who wouldn't say good things about you?

Plan the process at the start so that it goes smoothly in the execution.

3. Analysing a CV:

The CV gives many hints to a person's character but it is *not* their character. Use the CV to sort, not select.

- Layout – Is the layout tidy and accurate (attention to detail and organised), or crammed (unplanned and untidy approach)?
- Language – Look for strong words (managed, controlled etc.) rather than weak words (co-ordinated, attended etc.) as indicators of their approach to work. Look for correct spelling and grammar
- Timings – Check that all the time is accounted for e.g., is 1985–1987 really just 12/85 to 01/87!
- Achievements – Look for achievements and not just responsibilities.

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- Inconsistencies – Look for inconsistencies e.g., does the job title match the job description
- Use a checklist of your ‘must haves’ and ‘desirables’ to score each CV quickly.

CVs are to exclude those who do not fit the ‘must have’ criteria. Use other techniques for final selection.

4. Effective interviewing:

The interview is an opportunity for assessment of the candidate for the job and the job for the candidate. You are being assessed as well! They have passed the CV test and have the basic skills. The interview can show you what else is on offer. Use open questions to get better responses.

- Approach to work – How will they work? Every question in an interview is a ‘work task’ and the way the candidate approaches these tasks will tell you how they will work in real life. Do they rush? Do they consider and define? Do they complete the task? The answers are nearly irrelevant but the method for getting to the answer is vital.
- Perseverance – Failing is not a problem (as long as it is not a habit!) – It is not whether you fall down or not – it is if whether you get up afterwards that really counts. What was their most challenging project, what were the difficulties and how were they overcome?
- Achievement – What were the ‘Projects Completed’ (see Easy Guide 1), what were the achievements, and what was the impact? What were their failures and how did they deal with them?
- Values – You need the right cultural fit for any organisation. Does the job fit their social needs? What are their values and do they match the organisation's values?
- Motivation – Why are they applying for the job and why they are leaving their current employer. Can you fulfil their needs and do you want to?
- Strengths and weaknesses – Most people are not happy to talk about weaknesses, ask about strengths and then look at the reverse of the strength. ‘He who hesitates is lost’ versus ‘Act in haste, repent at leisure’. If their strength is ‘rapid decision making’ then probe to find if they have good judgement skills.
- Social skills – Do they have any and do they need them? Look for areas of possible conflict in the organisation.
- Initiative – Probe about projects that they have initiated and run (see Easy Guides 1 & 8). To maintain the status quo then you need an administrator, a manager's only real job is to start and manage change. If they don't have initiative then they will never be a manager.

Interviewing is to see if they have the soft skills and requirements. They shouldn't be there if they don't have the qualifications.

5. The sins of interviewing – what not to do:

- Never interview alone – Always have either multiple interviews or multiple interviewers so that you get several opinions and they get several viewpoints.
- Never talk too much – Talking too much may make you feel good but it is not a good interview. The less you say the more you will learn about the candidate and that is what the interview is for. Put the candidate at ease, present the company and then get them to talk through open questions.
- Never make it an interrogation – Give the candidate a chance to question you. The questions they ask you can show as much about them as the answers they give.
- Never wing it – Do your research on the job and the candidate. Prepare and use a checklist of standard questions for all candidates to get consistent answers.
- Never have a ‘mind set’ about the ideal candidate (especially one who thinks just like you) – Check that the basic skills are present and then look for the extras that can add value to the job. The extras come for free so it pays to get the most you can!

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- Never use instinct – Use your checklist to make rational choices. Liking a candidate is no reason to hire them. An interview is to find the best person for a job not to find new friends!
- Never stick rigidly to a script – Use your checklist but always be alert to follow-up or probe the candidate on comments. You can always return to the script after getting clarification.

Interviewing should be structured to get the most information.

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Easy Guide 10: TLA's (Three Letter Acronyms)

(An expert is someone who knows one more acronym than you!)

1. The Background

Manufacturing management is getting more complicated by the day and it is not helped by the proliferation of TLA's, FLA's and other code words. Without knowing the code words it is nearly impossible to understand what people are talking about. The guide below is a random smattering of the various acronyms with some 'tongue-in-cheek' definitions to help understand what they mean. No responsibility is accepted for getting it wrong or upsetting people. Send me your favourites and I can extend the list.

2. Two Letter Acronyms

- **IS** – Information Systems: Systems that allegedly provide information but most actually hide information in a mass of data.
- **IT** – Information Technology: The enabling technologies for IS.
- **QA** – Quality Assurance: Controlling product characteristics by a variety of techniques before and during production. Before the event quality is always more effective.
- **QC** – Quality Control: Trying to control product characteristics by inspection after design and manufacturing systems are fixed. A futile effort that is always after the event.
- **SC** – Significant Characteristic: A feature (dimensional or visual) that defines the 'quality' of the product as perceived by the user.
- **VA** – Value Analysis: Examination of the product's cost components to reduce cost. After the event.
- **VE** – Value Engineering: Examination of the product's cost components during design to reduce cost. Before the event. Old concept now revitalised by the introduction of Target Costing.

3. Three Letter Acronyms (TLA)

- **AMT** – Advanced Manufacturing Technology: A range of techniques and tools (mainly computer based) to improve manufacturing processes.
- **AQL** – Acceptable Quality Level: Quality control based on the number of defects that are permitted per thousand delivered items. Correct use of quality techniques makes this concept outdated.
- **AQP** – Advanced Quality Planning: Quality planning set into the business framework – scheduling, product definition, prototype development, manufacturing preparedness techniques used at the source of the product.
- **BBO** – Broad Brush Overview: What this gives for the TLA's. See you're getting the hang of it already!
- **BOM** – Bill of Materials: A list of the parts that are required to make up a final manufactured item. Generally generated as part of a MRP or similar system.
- **C_{pk}** – Process Capability Measure: Defines if the process is capable of producing to the required specification. Should be greater than 1.33.
- **CAD** – Computer Aided Design:
- **CAE** – Computer Aided Engineering:
- **CAM** – Computer Aided Manufacturing:
- **CIM** – Computer Integrated Manufacturing:
- **CBA** – Condition Based Assessment: Methods for determining machine conditions and determining maintenance needs.

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- **CNC** – Computer Numerically Controlled:
- **DFA** – Design for Assembly: Design process (pioneered by Boothroyd and Dewhurst) to reduce part count and make products easier to assemble.
- **DFM** – Design for Manufacture: Extension of DFA to ensure that designed parts can be manufactured cost-effectively.
- **EDI** – Electronic Data Interchange: Methods and tools for exchange of data between customers and suppliers. Internet technologies are largely superseding proprietary systems.
- **ERP** – Enterprise Resource Planning: The successor to MRP and MRPII (because in most case neither worked properly).
- **EBQ** – Economic Batch Quantity: The result of inefficient set-up processes where the cost of set-up has to be amortised over a large production run.
- **FMS** – Flexible Manufacturing System: Manufacturing systems that a capable of producing a range of products on advanced machinery. Cell based manufacturing can be more cost effective.
- **JIT** – Just In Time: Production management based on pulling products through the production system rather than pushing the orders. Thought by many to be related mainly to suppliers but in reality it is internal discipline that is more important.
- **LAN** – Local Area Network: Computer network based largely on a single site or office.
- **MIS** – Management Information System: Code words for what is most often a Management Data System with little real information hidden in the wealth of data.
- **MRP** – Materials Requirements Planning: Computer based planning method for production management. Can be effective but tends to lock the system in stone and give inflexible production management.
- **MRP II** – Manufacturing Resource Planning: MRP didn't work too well so they rebranded it as MRPII and sold it again.
- **NVA** – Non-Value Activity: An activity that does not add value e.g. storing, moving, counting etc.
- **OEE** – Overall Equipment Effectiveness: Measures how well equipment is running, quantity of products being produced and the quantity of good output. A crucial part of TPM.
- **OPT** – Optimised Production Technology: Production improvement method based on bottleneck improvements.
- **QFD** – Quality Function Deployment: A set of tools to highlight where engineering effort is needed to improve and maintain quality.
- **RCM** – Reliability Centred Maintenance: Processes for keeping machines operating reliably.
- **SPC** – Statistical Process Control: Control the process and you will control the output. Before the event controls.
- **SQC** – Statistical Quality Control: Tools for assessing how many rejects you have made. After the event controls.
- **STA** – Supplier Technical Assistance: Assistance provided by customers to enable suppliers to understand the TLA's.
- **TPM** – Total Productive Maintenance: Method for the reduction of equipment breakdowns and improved worker productivity. Based on both preventative and predictive maintenance.
- **TQM** – Total Quality Management: Combination of systems, training, commitment and tools to produce quality at source.
- **WAN** – Wide Area Network: What do you call the manager of a WAN? Obviously he is a WAN...
- **WCM** – World Class Manufacturing: What you achieve if you use all of the TLA's.
- **WIP** – Work In Progress: don't learn this one, instead get rid of the WIP and save money, time,

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effort and get smarter.

- **ZQC** – Zero Quality Control: Quality control through process control and mistake proofing.

4. Four Letter Acronyms (FLA) – The advanced course

- **APQP** – Advanced Product Quality Planning: Methods for product quality planning before production. Uses FMEA and Control Plans for Quality Assurance (QA). An advanced case of AQP that emphasises product quality. See QS 9000.
- **FMEA** – Failure Modes Effects Analysis: Analysis of process and product design to rank possible failure modes and establish preventative action before the event.
- **CAPP** – Computer Aided Process Planning:
- **OTED** – One Touch Exchange of Dies: Die change based on a single event. The ultimate goal of SMED.
- **PPAP** – Production Part Approval Process: Process for approval of production parts for use. See QS 9000.
- **SMED** – Single Minute Exchange of Dies: Radical approach to die changeover and set-up time reduction.

5. Code Words

- **5-S** – ‘seiri, seiton, seiso, seiktsu and shitsuke’ or ‘organisation, orderliness, cleanliness, standardised cleanup and discipline’. Japanese method for workplace improvement.
- **6 Sigma** – Quality management based on the production of parts within the boundaries of 6 standard deviations of the mean. This will result in 99.73% of all parts being produced within the limits.
- **Ishikawa Diagram** – Cause and effect diagram that seeks to identify the possible causes of a specific effect.
- **ISO 9001** – International Standard for quality management systems.
- **ISO 14001** – International Standard for environmental management systems.
- **Jidoka** – ‘Human automation’ of the process by standard operations to prevent errors.
- **Kaizen** – Continuous improvement by small incremental steps.
- **Kanban** – Japanese word for signal. A kanban is a signal that the next workstation requires more material to work on.
- **Lean Management** – Consolidation of improvement systems into a single coherent process for continuous improvement, cross-functional management and employee involvement. ‘Lean’ because parts, people and processes are reduced.
- **Pareto Principle** – The 80:20 rule expressed in the name of the economist Vilfredo Pareto (who discovered the rule).
- **Poke-yoke** – Mistake proofing or the building of fool-proof devices to ensure quality.
- **QS 9000** – Automotive industry extensions to ISO 9000.
- **Taguchi** – Design of experiments to allow more than one variable to be changed at a time and reduce the number of experiments.
- **Target Costing** – Method of working from the cost back to the design rather than vice versa.

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Easy Guide 11: Polymer processing methods

(The right process for the job – reducing costs by the right choice)

1. Thermoplastics processing methods

- Thermoplastics are materials which soften when heated and can then be formed whilst soft. After cooling they becoming rigid take up the applied form. The softening and forming processes are reversible. Thermoplastics are probably the most widely used type of polymer. The group includes most of the 'commodity' plastics such as polyethylene, PVC, polypropylene, nylons (polyamides) and polystyrene.

Thermoplastic Processing Methods					
Processing Method	Equipment Cost	Tooling Cost	Cycle Time	Precision	Economic Quantity
Extrusion	A	B	D	A	D
Injection Moulding	A	A	A	A	A
Blow Moulding	A	B	A	B	A
Rotational Moulding	B	C	C	B	B
Thermoforming	B	C	B	C	B

Key				
	A	B	C	D
Costs	High	Moderate	Low	
Time	<1 min	1-3 min	>3 min	Continuous
Precision	Good	Moderate	Poor	Not applicable
Quantity	> 10K	100 to 10K	<100	>5Km

2. Polymers and processing methods

- Not all thermoplastics can be processed by all the methods. This table is a guide to what thermoplastics can be processed by each method.

Polymers and Processing Methods						
Material	Process	Extrusion	Injection Moulding	Blow Moulding	Rotational Moulding	Thermo-forming
ABS		Yes	Yes	No	Yes	Yes
EVA		No	No	No	Yes	No
PA		Yes	Yes	No	Yes	No
PC		Yes	Yes	Yes	No	Yes
PE-LD		Yes	Yes	Yes	Yes	No
PE-HD		Yes	Yes	Yes	Yes	No
PMMA		Yes	Yes	No	No	Yes
POM		Yes	Yes	Yes	No	No
PP		Yes	Yes	Ye	No	Yes
PS / PS-HI		Yes	Yes	Yes	Yes	Yes
PVC-U		Yes	Yes	Yes	Yes	Yes
PVC-P		Yes	Yes	Yes	Yes	Yes
SAN		Yes	Yes	Yes	No	No

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3. Thermosetting processing methods

- Thermosetting materials are materials that are formed whilst warm or hot but once formed they set in the formed shape. Cooling and reheating do not make thermosetting materials go soft again. The forming process is not reversible. Thermosetting materials were the first type of polymer to be produced e.g., Bakelite, but are still widely used for many applications. Typical thermosetting materials are phenol formaldehyde resins, urea formaldehyde resins, epoxy resins and most rubbers.

Thermoset Processing Methods					
Processing Method	Equipment Cost	Tooling Cost	Cycle Time	Precision	Economic Quantity
Compression Moulding	B	A	B	A	A
Transfer Moulding	B	A	B	A	A
Injection Moulding	A	A	A	A	A
Liquid Casting	D	C	C	B	C
DMC and SMC	B	A	B	A	A
RIM and RRIM	B	B	B	B	B
GRP (Hand Lay-up)	D	C	C	C	C
GRP (Spray and Match Die)	B	B	B	B	B
Filament Winding	B	C	C	C	C
Pultrusion	B	B	D	B	D

Key				
	A	B	C	D
Costs	High	Moderate	Low	None
Time	<2 min	2-5 min	>5 min	Continuous
Precision	Good	Moderate	Poor	Not applicable
Quantity	> 10K	100 to 10K	<100	>5Km

4. Features and Processing Methods

Features and Processing Methods						
Feature	Process	Extrusion	Injection Moulding	Blow Moulding	Rotational Moulding	Thermo-forming
Equipment Cost		High	High	High	Moderate	Moderate
Tooling Cost		Moderate	High	Moderate	Low	Low
Cycle Time		Continuous	<1 min	<1 min	>3 min	1-3 min
Economic Quantity		>5Km	>10K	>10K	100 - 10K	100 - 10K
Precision		Good	Good	Moderate	Moderate	Low
Wall Thickness Control		Yes	Yes	No	No	No
Open-ended Hollows		No	Yes	Yes	Yes	Yes
Enclosed Hollows		No	No	Yes	Yes	No
Very Small Items		No	Yes	No	No	No
Intricate Shapes		Yes	Yes	Yes	No	No
Large Enclosed Volumes		No	No	Yes	Yes	No
Inserts		No	Yes	No	Yes	No
Moulded-in Holes		No	Yes	No	No	No
Threads		No	Yes	Yes	No	No

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Easy Guide 12: Set-up Time Reduction

(Batch size reduction is possible now!)

1. The background

In the past a lot of effort has been put into reducing the cycle time and speeding up the output rate whilst totally ignoring the changeover time from one product to another. This has led to the Economic Batch Quantity (EBQ) concept and has resulted in small batches appearing to be uneconomical to run.

Whatever an order consists of then the complete order must be produced and delivered before the customer will pay for any of the order. In a typical factory some products are made and stored until enough orders are available for low demand items to make the changeover worthwhile. Reducing set up times allows the introduction of variety as a competitive edge and a manufacturing advantage. What would sales be like if alternate-coloured products could be produced? What would it do the cash flow, storage needs and ability to sell higher value-added products?

Reducing set-up times (which we rarely concentrate on) can give the equivalent of a huge increase in process speed (which we almost always concentrate on). This is all achieved without detriment to the quality of the product (almost always a by-product of increasing output speed).

The ideal of a set-up time reduction plan is to move towards SMED (Single Minute Exchange of Dies) or OTED (One Touch Exchange of Dies). These remove set-up times entirely and make EBQ concepts redundant. Large batches no longer appear on the shop floor, lead times disappear, work in progress disappears, customer response is improved and variety can be increased. Making daily and selling daily becomes normal rather than a dream.

In many cases set-up time reduction can be achieved simply by changing the working method and 80% of the benefits can be achieved simply by working smarter rather than faster. Set-up time reduction is not difficult and the benefits are huge.

2. The method

In general, the sequence for improvement of set-up times (without significant investment) is:

Stage 1: Analyse the existing changeover times.

Try putting these on a chalkboard to show the employees what is important. There will be an immediate improvement. You need to start out by setting a baseline so that you can measure the improvements.

Stage 2: Divide the total time into internal and external set-up operations.

'Internal Set-up Operations' are operations that can only be carried out when the machine has stopped.

Improvements can be made by:

- quick change tooling / connections.
- standard base plates with doweled or quick locate and fit connections.
- combining handed tooling.
- parallel operations.
- set-up sheets for all variables.

'External Set-up Operations' are operations that can be carried out while the machine is running.

Improvements can be made by:

- pre-setting of tooling.
- pre-setting of gauges.

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- keeping tool kits for all operations beside the machine.
- special equipment availability.
- standard base plates and connectors.

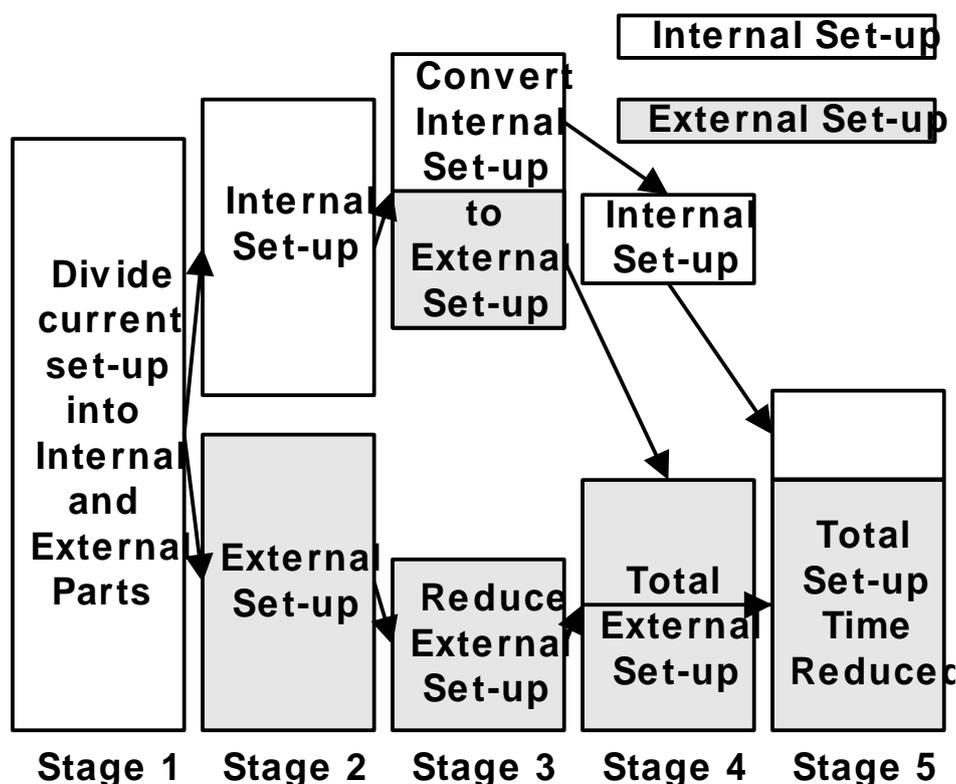
Stage 3: Convert as many internal operations as possible to external operations (duplicate tooling?).

External operations can and should be done while the machine is operating. Converting internal operations to external operations will quickly reduce the set-up time.

Stage 4: Reduce internal set-up and external set-up further through experience.

Stage 5: Start the process again from a much-reduced total set-up time.

This process is illustrated below.



The set-up time reduction process

3. Summary

Set-up times are a key area in the drive to continuously improve productivity performance. Established standards and targets should be set regularly and visibly displayed and there must be a regular audit to evaluate rates of improvement.

Try putting these on a chalkboard to show the employees what is important. There will be an immediate improvement. You need to start out by setting a baseline so that you can measure the improvements.

The process is not a once-and-for-all process but continues as part of the continuous improvement programme.