



Improvement at Curtin

Organisational Development Unit

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A manual developed by The Organisational Development Unit.

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The original version of this publication was prepared by Helen Hardcastle, Learning Horizons.

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Contact: Organisational Development Unit

Unit 2, 8 Sarich Way

Technology Park

Bentley WA 6102

Email orgdevelopment@curtin.edu.au

Phone +61 8 9266 4140

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Introduction

“To be an international leader shaping the future through our graduates and research, and positioned among the top 20 universities in Asia by 2020.” (Curtin University Vision Statement)

As resources are scarce and our expectations are greater, we need to focus on improving process to ensure meaningful progress toward our goals.

Making time for improvement is not always easy, but the broader impact of an organisation falling into a vicious work cycle has long term consequences on an organisation’s ability to carry out its core business. At Curtin, we strive for excellence in all we do, and this includes our own internal processes.

This manual introduces simple concepts that when applied across the University, will lead to meaningful change. It presents best practice principles for process improvement and process management, framed in the broader context of where processes fit into systems, via a simple overview of systems thinking. The manual presents a four step model (ADRI model) for continuous improvement. Having provided a background to process improvement, the manual concludes with an overview of tools and techniques that can be applied in your area.

The concepts and tools documented here will assist your area to focus on identify improvements, and take the necessary steps towards ensuring positive changes occur.

1 Why improve

1.1 The need for improvement

Organisations recognise the need to focus on all aspects of their performance from a value perspective in an increasingly demanding and competitive University environment.

1.1.1 Why improve?

Organisations that seek to improve:

- gain improved student and client (termed 'customer') satisfaction
- are agile and adaptive in ever increasing complexity and demanding work
- are efficient, have less rework and complexity and are a great place to work.

Vicious cycle versus virtuous cycle

Organisations that spend time in the '**vicious cycle**' have:

- little time to improve
- they are reacting, fixing problems and adding complexity
- are often not fixing the cause of the problem.

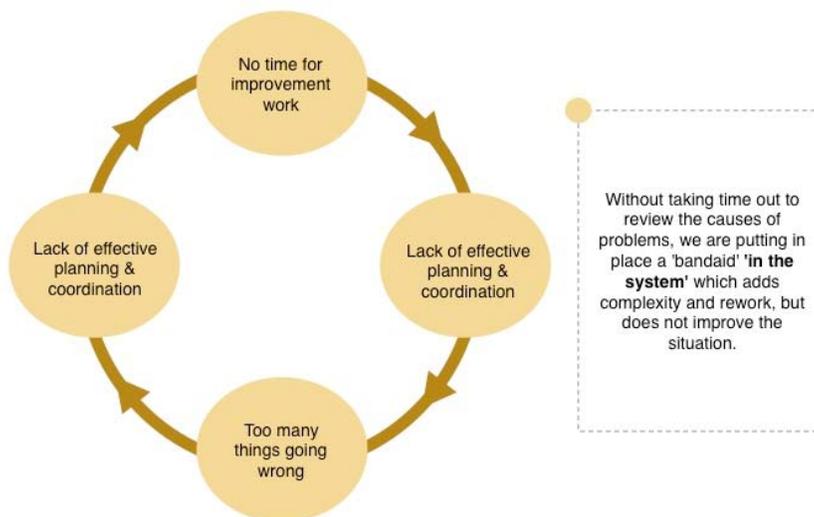


Figure 1 Vicious Cycle

The '**virtuous cycle**' allows organisations to:

- take time out of the system to focus on planning and improving processes
- enables improved efficiency
- ultimately increases time available.

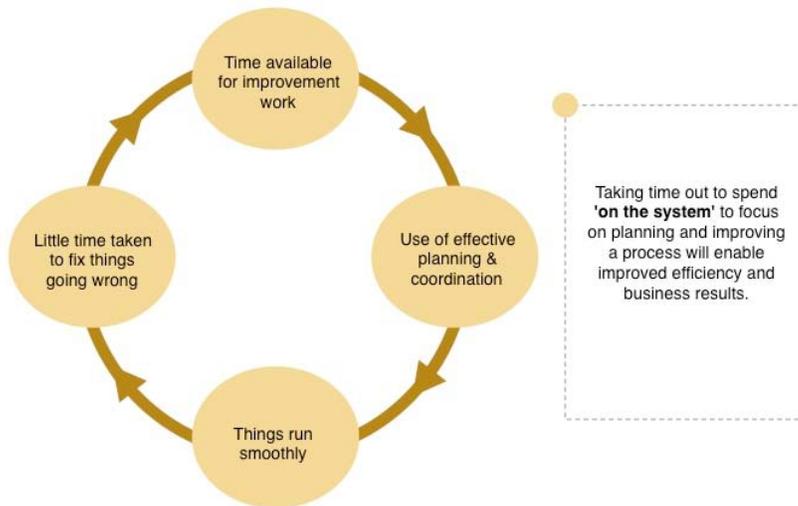


Figure 2 Virtuous cycle

Simply doing work faster without reviewing underlying causes and issues may cause 'temporary relief', but invariably will increase complexity and non-value adding work.

The Consequences of not focusing on improvement

- Poor quality outputs and outcomes.
- Missed and wasted opportunities.
- Rework, waste, lost time.
- Customer (student and client) complaints.
- Poor safety record.
- Low employee morale and stress.
- Distracted effort.
- Too many things going wrong.
- Time taken to 'fix' things.

TIP:

If we don't change the process, we will continue to achieve the same results.

1.1.2 How do we make time for improvement?

Some of us get so used to the adrenaline rush of handling crises that we become dependent on it for a sense of excitement and energy, which can be exhilarating. We feel validated and we get good at it. It brings instant results and instant gratification, solving urgent crises. This can become habitual as we are expected to be busy and overworked (see 'First Things First', S. Covey¹).

It is the addictive nature of crisis and urgency of operational activity that prevents us from making time to plan or improve how work happens. The 'vicious' cycle is exhausting and, whilst 'in the system' fixing problems we 'band aid' adding complexity and rework, without taking time out 'on the system' to review the non-urgent, most important, analyse causes of the problem to improve. If we 'band aid' and don't change the process, we will continue to produce the same results. It is critical to spend time 'on the system' to improve our business results. This will require a re-prioritisation of the non-urgent important activity (see Covey's time management matrix below).

Table 1 Covey's Time Management Matrix

Urgent and important	Not urgent and important
<ul style="list-style-type: none"> • Crises • Pressing problems • Deadline driven projects 	<ul style="list-style-type: none"> • Prevention • Relationship building • Recognising new opportunities • Planning • Recreation
Urgent and not important	Not urgent and not important
<ul style="list-style-type: none"> • Interruptions • Some phone calls • Some meetings • Proximate pressing matters • Popular activities 	<ul style="list-style-type: none"> • Trivial, busy work • Some mail • Some phone calls • Time wasters • Pleasant activities

¹ Covey, S. et al 1999. *First things first*. Simon & Schuster UK Ltd. London. UK.

Simply doing more work faster without reviewing underlying causes and issues may cause 'temporary relief', but invariably will increase complexity and non-value adding work. The 'virtuous' cycle demands more reflective, less 'adrenaline pumping' time out. 'Time out' on the system focusing on planning and improvement will improve efficiency and ultimately increase time available.

Table 2 Virtuous and vicious cycle attributes

Virtuous	Vicious
<ul style="list-style-type: none"> • Direct service/production • Indirect service/production • Improvement 	<ul style="list-style-type: none"> • Fixing errors • Fixing administrative errors • Unproductive meetings • Checking due to unreliability • Unnecessary double handling • Follow up due to lack of action • Unnecessary documentation • Unnecessary interrupts • Rework due to unplanned changes

2 Concepts of process improvement

2.1 Fundamental principles of improvement

The following principles are the foundation of what has emerged as “best practice”² in terms of quality across the United States, Europe and Australia. The Curtin Quality Framework is based particularly on the European Foundation for Quality Management, which a number of universities across United Kingdom and Europe have now adopted. They form the basis of a unified theory of management and leadership, supported by research, providing an integrated philosophy of leadership.

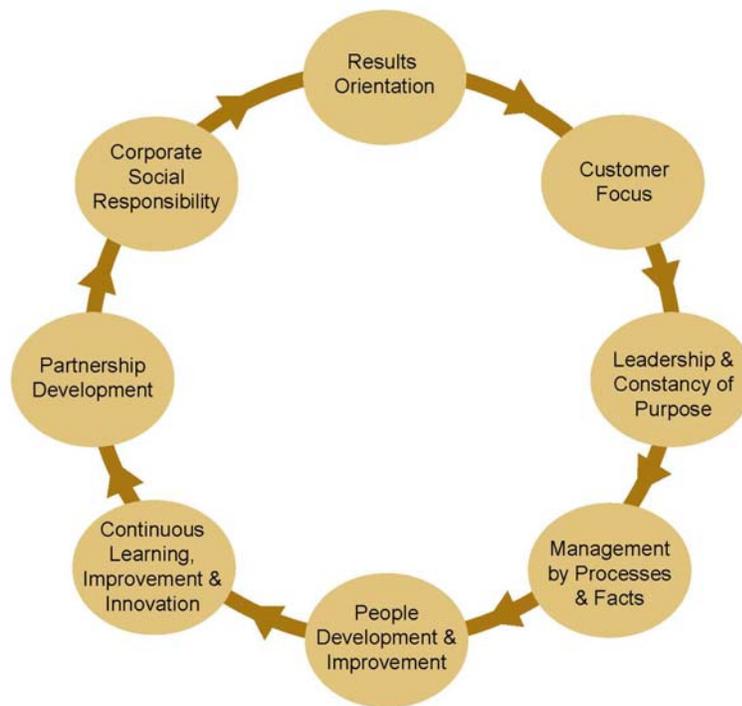


Figure 3 The fundamental concepts

² Australian Universities Quality Assurance AUQA uses the term “good practice” rather than “best practice”.

2.1.1 Results orientation

Principle 1

Excellence is achieving results that delight all the organisation's stakeholders.

How the principle is put into practice

In the fast changing environment that is today's world, excellent organisations are agile, flexible and responsive as stakeholder needs and expectations change, often frequently and quickly. Excellent organisations measure and anticipate the needs and expectations of their stakeholders, monitor their experiences and perceptions and monitor and review the performance of other organisations. Information is gathered from both current and future stakeholders. This information is used in order to set, implement and review their policies, strategies, objectives, targets, measures and plans, for the short, medium and longer term. The information gathered also helps the organisation to develop and achieve a balanced set of stakeholder results.

2.1.2 Customer focus

Principle 2

Excellence is creating sustainable customer value.

How the principle is put into practice

Excellent organisations know and intimately understand their customers. They understand that customers are the final arbiters of product and service quality. They also understand that customer loyalty, retention and market share gain is maximised through a clear focus on the needs and expectations of both existing and potential customers. They are responsive to those customers' present needs and expectations.

Where appropriate they segment their customers to improve the effectiveness of their response. They monitor competitor activity and understand their competitive advantage. They effectively anticipate what customers' future needs and expectations will be and act now in order to meet and, where possible, exceed them. They monitor and review the experiences and perceptions of their customers and, where things go wrong, they respond quickly and effectively. They build and maintain excellent relationships with all their customers.

2.1.3 Leadership and constancy of purpose

Principle 3

Excellence is visionary and inspirational leadership, coupled with constancy of purpose.

How the principle is put into practice

Excellent organisations have leaders who set and communicate a clear direction for their organisation. In doing so, they unite and motivate other leaders to inspire their people. They establish values, ethics, culture and a governance structure for the organisation that provides a unique identity and attractiveness to stakeholders. Leaders at all levels, within these organisations, constantly drive and inspire others towards excellence and in so doing display both role model behaviour and performance. They lead by e

During times of turbulence they display a consistency of purpose and steadiness that inspires the confidence and commitment of their stakeholders. At the same time they demonstrate the capability to adapt and realign the direction of their organisation in the light of a fast moving and constantly changing external environment and, in so doing, carry their people with them.

2.1.4 Management by process and facts

Principle 4

Excellence is managing the organisation through a set of interdependent and interrelated systems, processes and facts.

How the principle is put into practice

Excellent organisations have an effective management system based upon, and designed to deliver, the needs and expectations of all stakeholders. The systematic implementation of the policies, strategies, objectives and plans of the organisation are enabled and assured through a clear and integrated set of processes. These processes are effectively deployed, managed and improved on a day-to-day basis.

Decisions are based on factually reliable information relating to current and projected performance, processes and systems capability, stakeholder needs, expectations and experiences and the performance of other organisations, including, where appropriate, that of competitors. Risks are identified based on sound performance measures and effectively managed. The organisation is governed in a highly professional manner, meeting and exceeding all corporate external requirements. Appropriate prevention measures are identified and implemented, inspiring and maintaining high levels of confidence with stakeholders.

2.1.5 People development and involvement

Principle 5

Excellence is maximising the contribution of employees through their development and involvement.

How the principle is put into practice

Excellent organisations identify and understand the competencies needed, both now and in the future, in order to implement the organisation's policies, strategies, objectives and plans. They recruit and develop their people to match these competencies and actively and positively support them throughout. Personal development is promoted and supported allowing people to realise and unlock their full potential. They prepare people to meet and adapt to the changes required of them both in terms of operational changes and personal capabilities.

They recognise the increasing importance of the intellectual capital of their people and use their knowledge for the benefit of the organisation. They seek to care, reward and recognise their people in a way that builds their commitment and encourages their loyalty to the community. They maximise the potential and the active involvement of their people through shared values and a culture of trust, openness and empowerment. They utilise that involvement to generate and implement ideas for improvement.

2.1.6 Continuous learning, innovation and improvement

Principle 6

Excellence is challenging the status quo and effecting change by using learning to create innovation and improvement opportunities.

How the principle is put into practice

Excellent organisations continually learn, both from their own activities and performance and from that of others. They rigorously benchmark, both internally and externally. They capture and share the knowledge of their people in order to maximise learning across and within the organisation. There is an openness to accept and use ideas from all stakeholders. People are encouraged to look beyond today and today's capabilities. They are careful to guard their intellectual property and to exploit it for commercial gain, where appropriate. Their people constantly challenge the status quo and see opportunities for continuous innovation and improvement that add value.

2.1.7 Partnership development

Principle 7

Excellence is developing and maintaining value-adding partnerships.

How the principle is put into practice

Excellent organisations recognise that in today's constantly changing and increasingly demanding world, success may depend on the partnerships they develop. They seek out, and develop, partnerships with other organisations. These partnerships enable them to deliver enhanced value to their stakeholders through optimising their core competencies. These partnerships may be with customers, society, suppliers or even competitors and are based on clearly identified mutual benefit. Partners work together to achieve shared goals, supporting one another with expertise, resources and knowledge and build a sustainable relationship based on mutual trust, respect and openness.

2.1.8 Corporate social responsibility

Principle 8

Excellence is exceeding the minimum regulatory framework in which the organisation operates and to strive to understand and respond to the expectations of their stakeholders in society.

How the principle is put into practice

Excellent organisations adopt a highly ethical approach by being transparent and accountable to their stakeholders for their performance as a responsible organisation. They give consideration to, and actively promote, social responsibility and ecological sustainability both now and for the future. The organisation's Corporate Social Responsibility is expressed in its values and integrated within the organisation. Through open and inclusive stakeholder engagement, they meet and exceed the expectations and regulations of the local and, where appropriate, global community. As well as managing risk, they seek out, and promote opportunities to work on mutually beneficial projects with society inspiring and maintaining high levels of confidence with stakeholders. They are aware of the organisation's impact on both the current and future community and take care to minimise any adverse impact.

3 Processes and systems

3.1 Why focus on process?

Everything done is a process. Processes are a series of interrelated steps or tasks, which produce or result in something: a thing or product, a service, an action or an idea. In short, a process embodies all things that occur that result in something happening. A process is not a problem but most processes have problems.

A process has a definite starting and ending point. Inputs (materials, ideas, orders, activities, requests, etc.) enter at the starting point and are provided by suppliers. Outputs, or the result of the process, emerge at the ending point and go to the process customers (students and clients). Those who perform the steps in the process are the operators. Every process has suppliers, operators and customers.

Processes are the means by which all work is done. A very small business like a fresh flower stand involves dozens and dozens of processes. Companies and organisations have thousands of processes for conceiving, planning and doing the work and supporting and maintaining the organisations. Quality is about continually studying and improving all the processes and 'studying and improving processes' are processes as well.

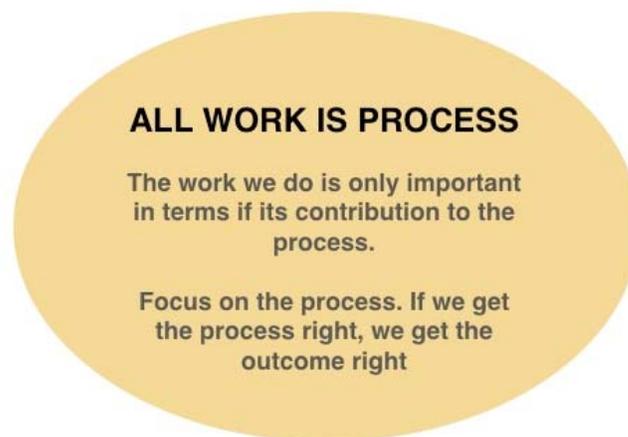


Figure 4 All work is process

3.1.1 What is systems thinking?

Some people think the 'structure' of an organisation is the organisation chart. Others think 'structure' means the design of organisational work flow and processes. But in systems thinking, the 'structure' is the pattern of interrelationships among key components of the system. That might include the hierarchy and process flows, but it also includes attitudes and perceptions, the quality of products, the ways in which decisions are made, and hundreds of other factors.

The organisation is a 'system' of interactions and interdependencies, which is dynamic, adaptive and agile.

System principles (see Peter Senge *The Fifth Discipline*³) represent a more effective way of thinking and acting. A system is a perceived whole whose elements hang together because they continually affect each other over time and operate toward a common purpose.



Figure 5 *The organisation as a whole*

All organisations exist to pursue a purpose. Their purpose can be expressed as follows.

- The organisation is a system.
- The system comprises processes and relationships that are made up of all kinds of activities.

³ Senge, Peter, 1994. *The fifth discipline*. Currency Double Day. New York. USA.

- A well-structured organisation will be organised in such a way that all of its activities will contribute in an efficient and optimal way to the achievement of the organisation's purpose.

The system consists of countless interdependencies and internal interactions. Not only do all sections of an organisation move in a direction, they also interact with each other. All processes within the organisation, whether they are educating, purchasing, training or finance, should work together towards organisational outcomes. Where these function efficiently, the organisation is best able to achieve its goals.

Organisations also exist within systems. These larger systems can be described as the environment in which the enterprise operates. The environment contains stakeholders (those groups or individuals with whom the organisation comes in contact).

The organisation takes in inputs (from suppliers), carries out its activities (relationships and processes) which add value (transformations) and provides outputs (to stakeholders, including customers).

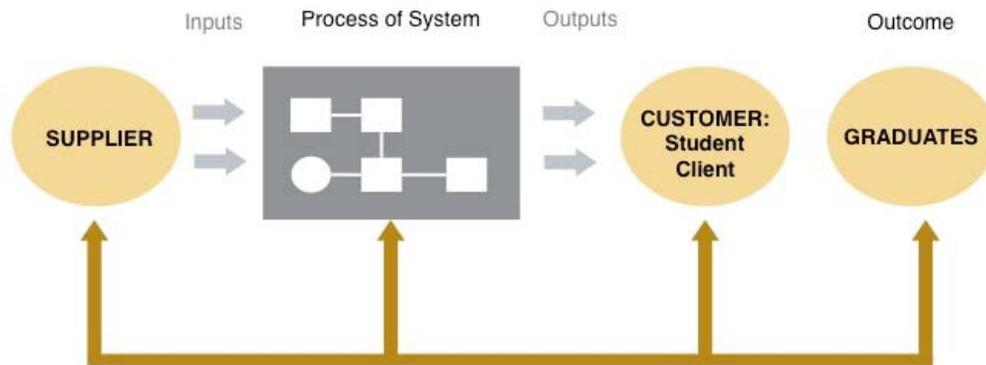


Figure 6 Process of system

- Processes are steps or tasks linked together.
- Processes have inputs or suppliers and need to meet the customer needs.
- Processes have outputs or customers (students, clients).
- Processes link together to form systems to achieve outcomes (graduates, contributing to society).

Since your organisation works through processes, you can only improve your work by improving processes.

3.1.2 What are processes?

Processes are:

- The steps taken to transform inputs to outputs.
- Designed sequence of tasks to meet customers' needs, either directly or indirectly, as contributors to another process.
- Cross a number of organisational boundaries - cross functional.
- Results orientated, focusing on goals and ends rather than actions and means (answering the question of 'what' rather than 'how').

How work is organised

Work is organised by:

- Tasks/procedures linking together to form steps (actions/decisions).
- Steps linking together to form processes.
- Processes linking together to form systems.

How quality is determined

Quality is determined by:

- An organisation being only as good as its processes.
- The capability of processes to meet customer requirements.

4 Process management

4.1 The principles of process improvement

Our principles and beliefs are seen by both our behaviours and actions.

Everyone wants quality. We look for services which are reliable and satisfy our needs.

Process Management is the application of knowledge, skills, tools, techniques and systems to define, visualise, measure, control, report and improve processes with the goal to meet customer (student and client) requirements efficiently to meet our outcomes.

The idea that "there is always a better way - let's find it" is fundamental. The never-ending search for improvement must become a part of the work place culture if we are to be successful. To remain competitive, organisations must strive to satisfy their customers by continually improving their products and services.

Continuous Improvement has become the foundation of a comprehensive leadership and management system in which are contained the key elements for achieving world best practice.

Improvement is based on five guiding principles

1. Strive for continuous improvement.
2. Process thinking: all work is part of a process.
3. Customer focus: manage customer requirements.
4. Teamwork: involve all people and work in a team.
5. Data driven improvement: make recommendations based on facts and data.

4.1.1 Strive for continuous improvement

Principle 1

Leaders strive for continuous improvement and support a culture of learning.

Any time you attempt to influence someone else's behaviour, you are a potential leader and the person you are attempting to influence is a potential follower. If you accept the role of leader, you also accept the responsibility for having an impact on the behaviour of other people.

How leaders support improvement

- Leaders understand why improvement will lead to results and outcomes for continuity.

- Leaders commit to and maintain improvement by providing support and encouragement through clear direction and purpose.
- Leaders focus on the key questions:
 - What needs improving?
 - What do our customers think?
 - What is the process?
 - Do we have data?
- Leaders encourage a 'No blame' work place culture that supports improvement of process versus blaming the person when things go wrong.
- Leaders identify improvement opportunities in the business plan, with identified resources.
- Leaders support specific skill and tool training.

4.1.2 Process thinking: all work is part of a process

Principle 2

Organisational 'design' and the capability and adaptability of the processes that make up the organisation determine organisational outcomes and success.

All work is part of a process. A process is a series of activities which end up in a result. Raw materials, equipment, the effort and skill of people are the resources brought together in a process to achieve a result.

Well designed processes result in good quality products and services. Poorly designed processes result in mistakes, waste and rework. This in turn results in frustrated employees, dissatisfied customers and extra costs to the organisation.

Focus on process problems, rather than blaming people working in the process for the cause of the difficulties. When things go wrong, it is nearly always because of the way the work is designed to be done - the process.

When driven to improve, organisations focus on:

- Understanding that work is made up of processes and that organisational services are only as good as the processes that make up the organisation.
- Process management system - processes documented, reviewed.
- Employee involvement in process document review.
- Processes: understanding process and how work happens versus focus on blaming people and working harder.
- Reducing complexity, rework and waste to ensure agility, adaptability and flexibility.
- Ensuring consistent and capable processes and service delivery.
- Improvement.
- Audit, quality assurance, review.

Organisations can improve by:

- Adopting a culture of learning how work happens and how it can be improved.
- Learning comes from review of work, focus on data, focus on customer feedback and external benchmarking.
- Taking time 'on the system' to proactively review and improve versus reactive problem solving 'in the system'.
- Knowledge - sharing, capturing.
- Lessons learnt, review focus on improvement.
- Innovation, new learning.
- No blame culture, support for learning.
- Systematic review, audit.

4.1.3 Customer focus: manage student and client requirements

Principle 3

Customer requirements and their perceptions drive organisational requirements and drive improvement. Customers demand organisations to listen, adapt and change fast. Understand customer feedback and manage.

Every organisation has suppliers and customers. They are critical to its success.

Understanding the customer/supplier relationship, whether it be internal or external, is a very important part of improvement.

- The customer who uses services is an "external" customer (student and client).
- The people within the organisation who work alongside each other in a process are also suppliers and customers.
- The people who depend on your work in order to do their work are your customers. You are their supplier.

A key factor in meeting our external and internal customers' requirements is to know what they want.

When driven to improve, organisations focus on:

- Valuing the customer and customer service
- Customer feedback processes - understand what the customer values to drive improvement (complaints, satisfaction)
- Customer guidelines and standards
- Reviewing and understanding customer feedback with a focus on improvement, data used for improvement
- Anticipating customer requirements, feedback into plans.

4.1.4 Teamwork: involve all people and work in a team

Principle 6

Organisations empower people, recognising the power of all people to make a significant contribution to organisational success. Value the employee; they need to be engaged in improvement. The organisation needs to be flexible, responsive and adaptive with teams overlapping and interactive to drive improvement.

People, who do the work, know best how it is done.

Involving people in improving the processes in which they work is interesting, stimulating and rewarding for them. It gives people a sense of 'ownership' of their own work processes. People will feel they have a greater contribution to make if they feel a sense of empowerment.

The knowledge and skills of people at all levels in the organisation is recognised and utilised through teamwork. Teams work together to find opportunities for improvement.

When driven to improve, organisations focus on:

- Involving and engaging people
- Ensuring people doing the work are involved in improvement: the only people who know how to improve are the people doing the work
- Teamwork ensures people across the organisation work together to understand and improve how work happens
- Two way communication - up, down, across
- Induction
- Performance management.

4.1.5 Data driven improvement: make recommendations based on facts and data

Principle 5

Decisions are improved with data, information, knowledge, which is understood through the understanding of variation, predictability and customer requirement.

Decisions are based on facts and data rather than on personal opinion, gut feeling, intuition and even sometimes, experience. Recommendations for changes to processes should be based on trends of reliable data.

Emphasising the need to 'get the facts', we often find that what actually happens is quite different to what people think happens. The statistical 'tools' of improvement enables us to track performance over time and to identify and assess problems in processes.

When driven to improve, organisations focus on:

- Understanding that every process produces data and information
- Improved performance comes from an understanding of how the process is working through review of data
- Identified key performance indicators to measure performance
- Improvement data
- IT system support and retrieval
- Reviewing and analysing data
- Complexity can be reduced through the understanding of data and variation
- Data allows organisations to understand if their processes are predictable, stable and capable of delivery.

5 Process redesign and improvement

5.1 Process management and improvement

Curtin University adopts an approach to quality management that establishes the *culture* for quality enhancement and the principles that govern quality management.

The *culture* of quality at Curtin can be described as *learning organization* that seeks to create, acquire and transfer new knowledge and modifies its behavior accordingly ([Garvin, 1988](#)) Learning and leadership are promoted at all levels and individuals are encouraged to demonstrate responsibility and accountability.

The principles that govern quality management at Curtin can be derived from Total Quality Management (TQM) models that focus on leadership commitment, a clear mission and objectives, employee empowerment, customer focus and management by data i.e., indicators and measures.

From the many lists of TQM principles, the four most common principles are:

- **Commitment by top leadership;** which requires that the mission and objectives of the organisation be central to all activities, and that activities of the parts of the organisation tend towards achieving the organisation's overall objectives
- **Employee empowerment;** which means recognising the importance of people in the organisation, training them for the tasks they are expected to do, and giving them authority over their spheres of operation
- **Customer focus;** which means identifying who are the customers (internal and external) ensuring their needs and/or desires are correctly diagnosed, and acting so as to meet and exceed these
- **Management by data;** which means the selection of indicators and measures, the continual monitoring and analysis of these, and the systematic use of the results to improve performance.

Adopting the culture of a *learning organization* and managing according to the four principles of TQM allows Curtin to establish a common approach to management and decision making that will support quality enhancement.

This approach is supported through the simple four factor ADRI cycle of improvement.

Everyone knows how to improve their work. Often people get frustrated because 'nothing changes' or people simply 'break the rules' and work around the system to please the customer. Work increases in complexity and days get long.

It is important to raise ideas for improvement with the process owner to ensure ideas are not lost and change does happen.

Some ideas should just be implemented; others will require team members and more complex analysis, depending on the business risk. Consider using the four-step improvement methodology to ensure appropriate analysis.

Once processes are documented and monitored, they need ongoing review and improvement to ensure results are providing continuous customer value. Customers demand change and improvement, so processes need change.

5.1.1 Fundamental improvement: simplify and document the process

TIP:

Put a high value on simplicity – make and active effort to make things simpler.

The first step is to identify where "problems" exist. Encourage people to talk about "opportunities to improve the process" rather than "problems", to look for long term answers rather than short term, acknowledging that nearly all problems result from process failure of one kind or another. In addition:

- Understand the outcome, concepts and intent of the process.
- Be prepared to discard existing steps or tasks.
- Be prepared to explore alternatives, challenge assumptions.
- 'Shed' what is no longer needed.
- Be prepared to question:
 - Does each tasks need to be done? Is it rework?
 - Who needs to do the task?
 - Can it be done by someone else?
 - Can the task be done differently?
 - What is 'blocking' or causing inefficiencies?
- Be prepared to start again if redesign is easier than modification.
- Be prepared to 'trade' comprehensiveness for simplicity; perfection form practicality.
- Be clear on who is benefiting - the owner, the organisation, the customer.

It is important to involve others in documenting and capturing our work and processes. It is also critical to capture 'Best Known' process by fundamentally challenging or analysing how we are currently performing. Use of the following key process questions may assist:

- What do we want to get out of this process?
- What do we have coming in?
- What must we do to get from one point to another?
- What do we do that is necessary to reach our goals?
- Which steps are unnecessary?
- Where do we run into problems?
- What is the customer saying?

A step by step approach

The steps assist in the achievement of sustainable change. In using these steps:

- Underlying causes of the problems are surfaced (don't improve 'symptom', ask why six times and find the cause)
- Data is used in making improvement decisions and demonstrating improvement
- 'Memory' and knowledge are captured
- Improvement tools are used.

What are improvement tools?

Improvement Tools are information tools to explore information and to help people to work together efficiently and effectively. Specifically they provide process and structure for teams to:

- Collect information quickly and efficiently
- Involve everyone, giving people equal opportunity for participation
- Collate and display data so that decisions can be reached quickly while still being informed and based on facts.

5.1.2 Continuous improvement four step model: ADRI

Curtin University promotes the use of this simple four stage approach.

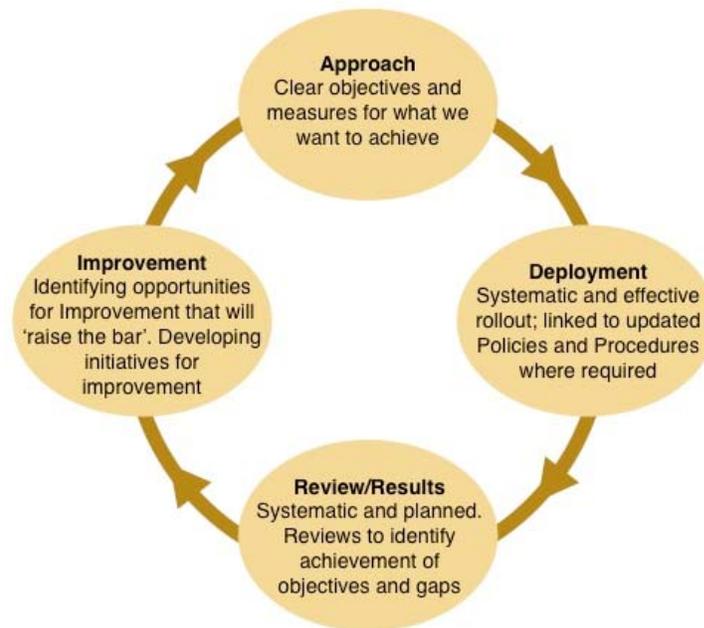


Figure 7 Continuous improvement 4 step model ADRI (Source: adapted version of Curtin University's ADRI)

The model is similar to PDCA, PDSA and DMAIC, often used in organisations. This approach is based on an adaptive learning model, the Shewart Cycle. The focus is on what does the process need to achieve and how can it be improved and then documented and controlled. When the improvement requires more complex tools, methodologies and statistical analysis, one of the methods, such as Six Sigma, which uses DMAIC (Define, Measure, Analyse, Improve, Control), may be useful to use. (See Appendix ADRI Framework – Curtin University)

Table 1 ADRI additional points to consider

<p>What needs to be achieved? Define the opportunity and target. What results are we aiming for? What does the customer/ stakeholder/student need?</p>	<p>What is currently happening? What is current process or workflow? Analyse existing problems. Measure the process.</p>
<p>Review the process. Does the process need improvement or redesigning? What is causing problems? Can we compare our process with others and benchmark?</p>	<p>What are our learnings? What needs to be documented and monitored? What needs to be controlled</p>

5.2 Four steps to improvement

5.2.1 Process management and improvement: key questions

The questions below will assist in the improvement process; the table and guide suggest improvement tools, which may be used.

APPROACH: Define outcomes and targets

- What is the current process or workflow?
- Is there an opportunity for improvement? What is the problem?
- Who should be involved in the improvement?
- Who are we serving by making this improvement? What do they want? (customers and stakeholders)
- What outcome is expected? What target are we aiming for?

DEPLOYMENT: Study the current situation, analyse and measure

- Analyse any existing problems.
- Document the process.
- Does the process need improving or redesigning?
- What are the customer requirements?
- Measure the process.
- Stable? capable?

RESULTS: Review and study

- How do other people manage this situation? (benchmark!)
- What are the possible causes of poor performance?

IMPROVE: Identify improvements and implement plan

- Redesign to meet customer requirements.
- What is out action plan? Who will do what, where and when?
- What are the potential actions we could take to improve?
- What documentation is required to capture the memory, support the improvement? Policy? Process flowcharts? Supporting documents?
- Who needs to be trained and coached to adopt the new way?
- What needs to be monitored?

5.2.2 Process management improvement summary

Table 2 Steps, processes and suggested tools

Steps	Processes	Suggested Tools
APPROACH	<p>Define what needs to be achieved and what is currently happening?</p> <p>Outcomes, scope</p> <p>Preferred results, targets and goals, performance standards</p>	<p>Targets</p> <p>Surveys</p> <p>School review</p> <p>Brainstorm</p> <p>Measurement - customer needs?</p> <p>Flow chart</p>
DEPLOYMENT	<p>Understand current process</p> <p>Measure</p> <p>Analyse</p>	<p>Flow chart</p> <p>Customer model</p> <p>Risk analysis</p> <p>Run charts, control charts</p>
REVIEW RESULTS	<p>Review, analyse, study</p> <p>Review</p> <p>Identify causes for variation and poor performance</p> <p>Benchmark</p>	<p>Brainstorm</p> <p>Pareto, cause and effect, prioritisation, cause and effect matrix</p> <p>Benchmarking</p> <p>School review</p>
IMPROVEMENT	<p>Identify improvements and document</p> <p>Explore options</p> <p>Performance – pilot</p> <p>Improvements</p> <p>Document</p> <p>Train</p>	<p>Targets</p> <p>Run chart, control chart</p> <p>Creative problem solving</p> <p>Cause and effect scenarios</p>

5.2.3 Applying statistical thinking to your process

Measurement is the process of assigning numbers to observations. Any measurement is the result of applying a procedure - change the procedure and the value changes. Measures will assist in assessing how the process performs in the future. It provides a basis for process audit.

These are the key steps to the process of applying statistical thinking

Decide what to measure. In this step need to we need to determine:

- What it is we need to measure.
- What data we need to inform us as to how the process is performing.
- We are very clear about the measure we will use.
- We must have a very clear and shared understanding so everyone is measuring the same thing.

Process measures

Process Measures can be collected to enable us to monitor and predict the extent to which a process is satisfying customer and stakeholder requirements. They are predictive measures as they are derived from customer and key stakeholder requirements and provide information from within the process as to whether their requirements are likely to be met.

Process Measures need to be quantifiable, measurable, timely, accurate and able to be controlled through process operation and design changes.

Process measures report on outcomes of steps, or group of steps, within the process. They are used by leaders to keep an eye on the 'health' of a process; specifically those measures that provide information on levels and trends that are useful in setting priorities and assessing performance.

5.2.4 Determining what to measure

The process outlined in the flowchart is designed to assist in making the 'what to measure' decision for your system or process.

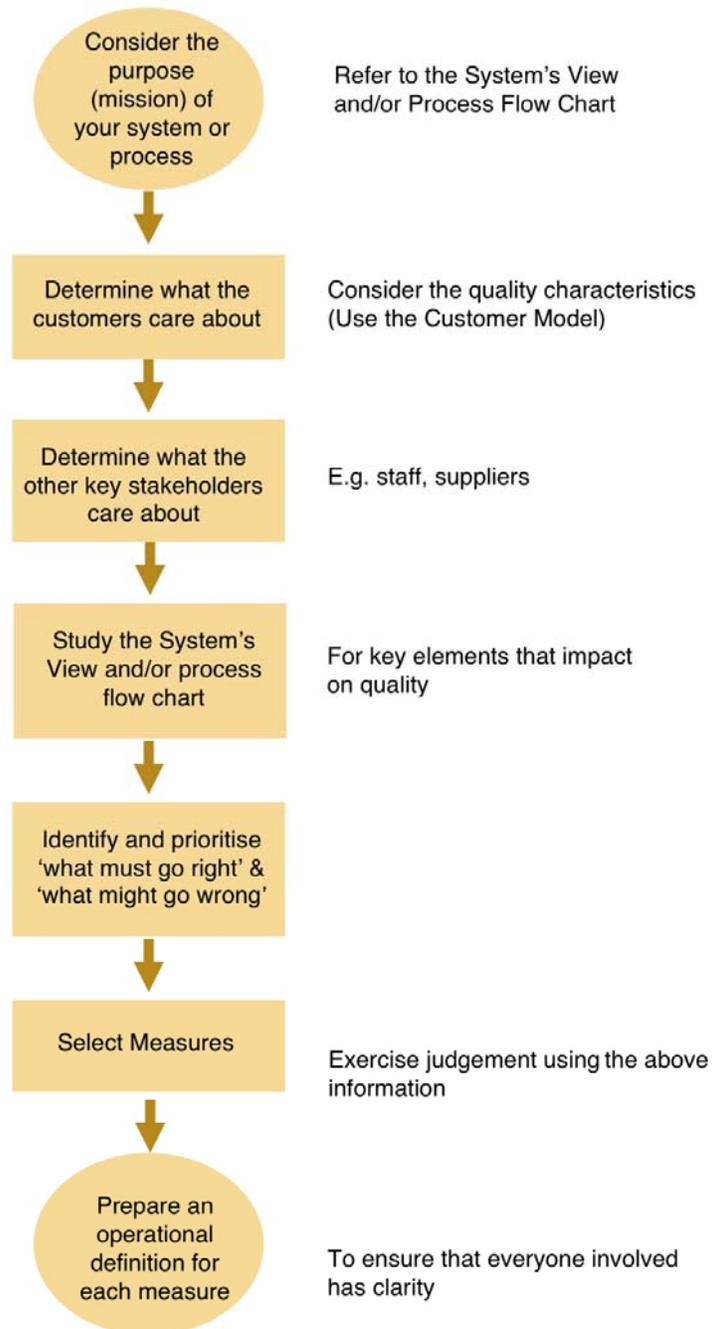


Figure 8 What to measure flowchart

The Customer Model tool can be used to determine those things the customer cares about (needs and expectations) and how they believe you are performing against those requirements - this informs discussion about 'what must go right' and 'what might go wrong' in the process.

Table 3 Customer model - measurement

CUSTOMER MODEL			
Process	Customer		Date
Requirements	Rating		Customer Comments
	<i>Importance</i> (1-10)	<i>Performance</i> (1-10)	
1.			
2.			
3.			
4.			

TIP:
Keep measurement simple and specific.

6 Tools

6.1 What are improvement tools?

Improvement Tools help people to work efficiently and effectively. Specifically, they provide process and structure for teams to:

- Collect information quickly and efficiently
- Involve everyone, giving people equal opportunity for participation
- Collate and display data so that decisions can be reached quickly while still being informed and based on facts.

6.1.1 Tools and techniques

6.1.1.1 Brainstorming

Brainstorming is a group creativity technique designed to generate a large number of ideas for the solution of a problem (Wikipedia). Together, gather creative ideas in as short a time as possible, to expand thinking to include all of the dimensions of a problem or solution.

Is this the right tool?

- Do you need a way to help a team broaden their focus and open the range of options they consider?
- Is the team bored or tired of the analytical process? Do members need a creative break?
- Do you need a way to maximise one of the key benefits of teamwork: team members use the ideas of others as springboards for their own contributions?
- Has the team discussion become circular and stuck?

Steps

1. Always write topic on flip chart/whiteboard before commencing to keep participants focussed.
2. Give participants 1 -2 minutes silence to think:
 - Structured - participants write down ideas and then call out ideas in rotation.
 - Unstructured - participants call out ideas whenever they come to mind.
3. Remind participants of ground rules (below).
 - Write up everyone's ideas, in the words of the speaker.

- Write on flip chart/whiteboard so everyone's idea is visible.
 - Build on ideas generated by others.
 - No interruptions/explanations (except at end and by exception, only if others do not understand).
4. Keep in mind The 6 Barriers:
 - The one right answer
 - Conformity
 - Fear of looking a fool
 - Failing to challenge the obvious
 - Evaluating too quickly
 - Self-imposed barriers.
 5. Remind participants to use a phrase rather than one word (e.g. using an action verb and noun).
 6. After exhausting all ideas, ask participants now 'to be really creative' and think of e.g. five more ideas.
 7. Do it quickly - 5 to 15 minutes in total.
 8. Group issues, which represent the same idea.

Ground rules

- Write up everyone's ideas, in the words of the speaker.
- Write on flip chart/whiteboard so everyone's ideas are visible.
- Never criticise/put down/laugh at ideas.
- Build on ideas generated by others.
- No interruptions/explanations (except at end and by exception, only if others do not understand).

6.1.1.2 Affinity diagram

To gather large amounts of data, organise into groupings based on natural relationships between items, using a creative rather than logical process, sorting rather than discussing.

Is this the right tool?

- Does your team need to find a starting point for discussion after it has brainstormed a large number of ideas?
- Is your team "stuck" and unable to break out of old ways of thinking?
- Do you need to create a positive atmosphere for everyone to think creatively about a tough problem?

- Has your team just generated lots of ideas and is asking "So What?"
- Does your team need to prevent individuals from dominating an important discussion?

Steps

1. Phrase issue to be considered.
2. Generate and record brainstormed ideas on post-its.
3. Randomly put up completed post-its on flipchart or whiteboard.
4. Silently sort post-its into related groupings.
5. Create headers and place at top of each grouping.
6. Draw and review the finished affinity diagram.

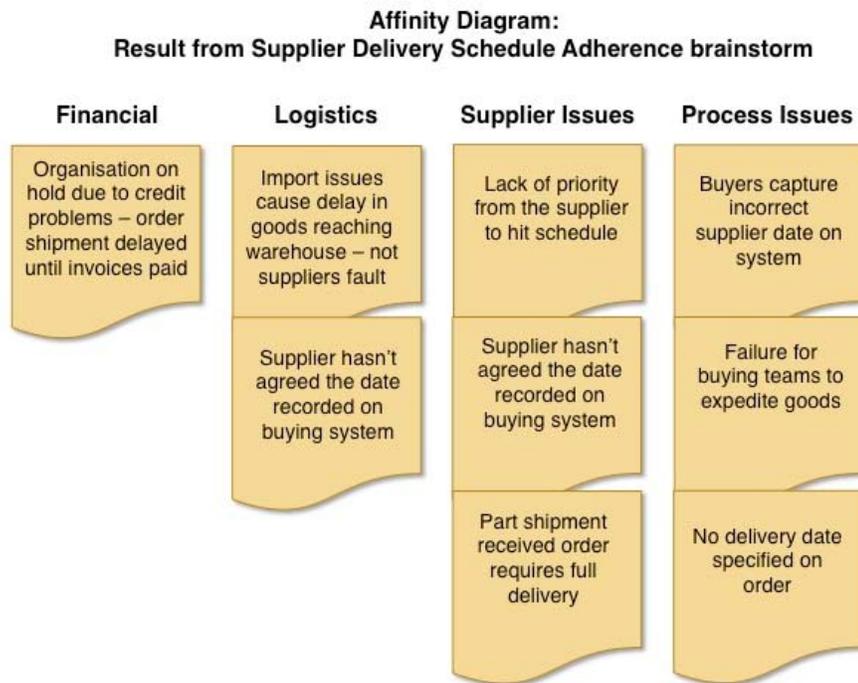


Figure 9 Affinity diagram

6.1.1.3 The Flow chart

To provide a graphic consensus picture of the process:

- a. to document the process before attempts are made to improve it (Detailed Flowchart); or
- b. to re-engineer or create a new process (Top Down Flowchart).

Is this the right tool?

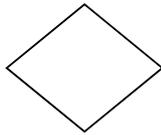
- Does the team need to see how a whole process works?
- Do team members need to identify critical points in a process where they might collect data?
- Does the team need to locate problem areas, bottlenecks, or instances where non-value added work is performed?
- Do team members need to see how different steps in a process are related?
- Is the team looking to identify the "ideal" flow of a process, from start to finish?

Detailed flow chart

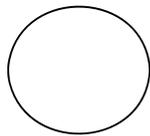
To identify the actual path any product or service follows in order to identify deviations and then to improve to create an ideal path. Using symbols, the Flow Chart shows in diagram form how a process is carried out.



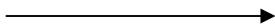
A rectangle represents a "stage" or particular activity in the process that does not involve decision-making.



A diamond represents an activity which does involve decision-making.



A circle represents some other process to which the process we are examining relates, but which we are not dealing with in detail in this flow chart.



An arrow shows the direction of flow of the process.

Figure 10 Elements in a flow chart

Steps

You will see a lot of information written in the top section of the flow chart. It identifies the process, the process owner, the intent of the process, and when and by whom the chart has been completed. This information should be written in every time.

1. What is the process intent?

What are we seeking to achieve with the process? What is the objective, or desired outcome? In other words, what is the Process Intent?

It is not a description of what happens, but a statement of what results we want from the process for ourselves and for our customers.

For example:

"Enter all details on the Work Order" is a description of the process.

"Provide accurately completed Work Orders to client departments within 48 hours of receipt" is the Process Intent.

It assumes the process is working perfectly and so provides us with a means of judging how effective the process is.

The Process Intent provides us with a unique opportunity to:

- Question why we are carrying out the process (at all), or why it couldn't better be carried out by someone else.
- Make sure everyone is working towards the same objective.
- Identify and resolve conflicting expectations (e.g. between supplier and customer).
- Establish ground rules for measuring or assessing performance.
- Examine assumptions that have developed as to why and how we do things.
- Focus attention on the key reasons for doing what we do.

It is not something that we draw up quickly, but something that we carefully consider and discuss with those involved in the process. It may take a few hours, or even longer, and involve a re-thinking of our whole approach to the process.

Once an accurate statement of Process Intent is agreed, write it down in the space provide at the top of the flow chart. Whenever the Quality Team reviewing the process meets, refer back to the Intent at the outset, so that it always serves as a focus for your efforts. Of course you may find it necessary to modify the Intent over time as a result of your investigations and improvement activities.

2. Who is the process owner?

Each process, or sub-process should be assigned a process owner. The process owner is responsible for making sure that action planned for the process is, in fact, carried out, and that the process is reviewed at regular intervals.

The process owner is generally the person most responsible for the outcomes of the process and would normally have authority to make changes to the process. However, sometimes the

end customer of the process is made the owner. An outsider, with no vested interest in the process, has sometimes been assigned the role of process owner.

In some cases two or more managers might compete for process ownership. They may have to determine between themselves who will be the process owner - if not, a manager to whom the other two ultimately report could take on the role.

3. Procedure

Drawing up a Flow Chart takes time. For a large process it can take many hours. It shows how the process is actually carried out - now how it is supposed to be carried out (except when we wish to draw up or 'imagineer' a flow chart of the way a process should be carried out when it has been improved).

As a general rule, try to deal with manageable "chunks" of process at any one time. You will find processes are more complex than you thought, there are more decision points than you imagined, and more alternative courses of action.

Pay particular attention to the actions that follow when things go wrong in the process e.g. we find ourselves out of stock of a part when the computer says we should have some etc. These are sources of waste and error.

Flow charts are valuable documents. They should be carefully stored as permanent records.

There is room for a process number to be written in the top right-hand corner. We suggest each process be numbered for reference purposes, filing etc.

4. Directions on how to construct a flow chart

1. Fill in the information at the top of the flow chart page:
 - The 'description' of the process is a general statement of what happens.
 - The 'intent' of a process is a specific statement of what the owner wants to achieve from the process.
 - The 'owner' of the process is the person who is responsible for it and who has authority to modify it.
 - The 'boundaries' are the points when the process starts and stops.
2. Identify the main people working in the process - the internal customers. List them under the 'Position' column according to the order in the process.
3. Interview the people involved in the process to find out what they do, the order in which things happen and how the process works. Write down the information in as much detail as you can. Ask as many questions as you need to in order to fully understand what happens in the process.

4. Decide if each step in the process is:
 - An activity (box).
 - A decision (diamond).
 - A set of activities which are relevant to the process but too complex to include exact details for this flow chart (circle).
5. Place the information on the flow chart. Use the correct symbol and place the steps in correct order next to the person who is responsible for the steps.
6. Number the steps and check that they are linked with arrows to show the direction of the process.
7. Check the flow chart with people you interviewed and follow up any difficulties you might have with the facilitator.

You will see a lot of information written in the top section of the flow chart. It identifies the process, the process owner, the intent of the process, and when and by whom the chart has been completed. This information should be written in every time.

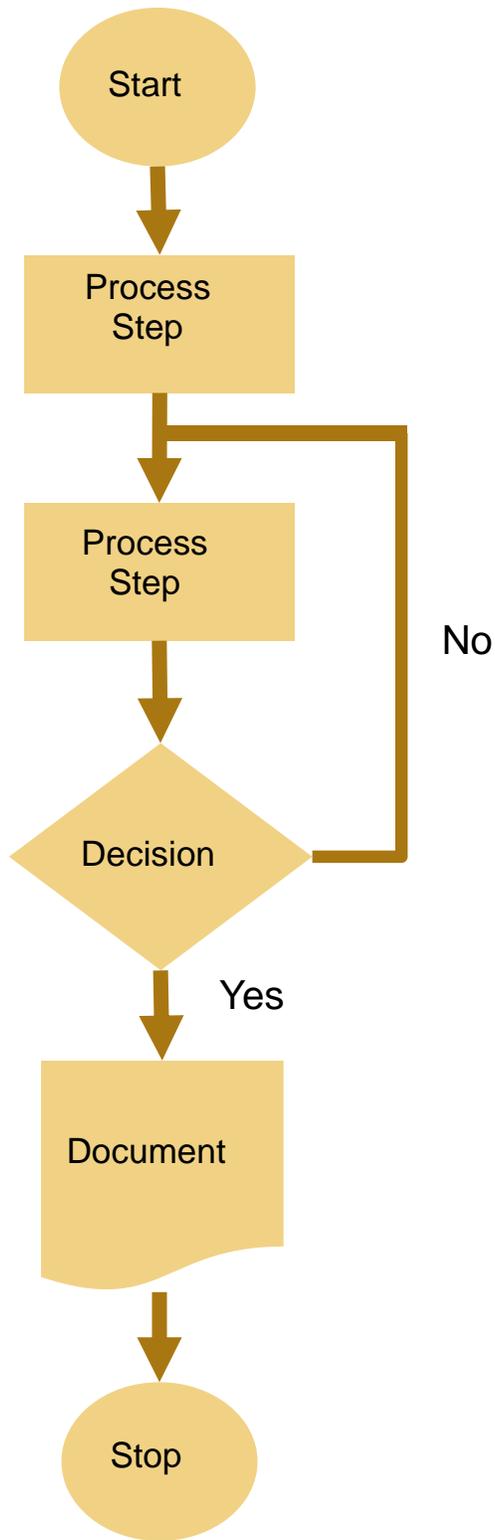


Figure 11 Example of a flow chart

6.1.1.4 The Customer model

It is important that you have direct discussions with customers and suppliers. On the basis of these discussions we can then draw up Customer Models for our customers - at each stage, as well as at the end - of the process. This helps to ensure that only acceptable inputs will enter the process and only acceptable outcomes will leave it.

The Customer Model is obtained by actually asking each customer of a process, or stage of a process, what they need from the process to enable them to do a perfect job themselves. Every significant characteristic is written down.

In constructing a Customer Model, do not be content with vague generalities. You will need to probe and discuss to construct a worthwhile model. As a result of the probing and discussion, however, you will generally find that you gain a new understanding of the process and uncover new avenues for investigation and new opportunities for improvement.

Try to quantify the customer's requirements wherever possible. For example, do not be content with "delivered in good time" as a customer requirement. Look for a specific time of the day, week or month, or a certain number of days prior to the next step in the process commencing etc. Here's an example.

Table 4 Customer model example

CUSTOMER MODEL				
Process: Receipt of delivery documentation				
Customer: Warehouse Supervisor				
	List of Requirements	Priority 1 - 10	Current Performance 1 - 10	Comments
1.	White, yellow and green copies stapled in top left hand corner	5	1	
2.	All information complete and clearly readable on every copy	10	6	
3.	Placed in "D/D Inwards" tray	3	7	
4.	Received by 4PM for next day delivery	9	7	
5.	Customer's special delivery requirements clearly stated. If no special requirements "N.R" to be written in.	10	6	
6.	Time of close of customer's warehouse inserted every time	10	3	
7.	Special packing instructions inserted where required	10	7	
8.	Credit authority box completed every time	10	8	
9.	Client order number stated	8	6	

6.1.1.5 Cause and effect diagram

A Cause and Effect Diagram is used to explore and display causes of a specific problem or issue. It is a useful way of analysing a problem systematically, clarifying the relationships that exist between various causes and suggesting possible avenues for improvement. It can also act as a valuable summary that can be used as a permanent record of all the factors that can contribute to a particular problem, adding new thoughts as they arise.

Use when?

- The team needs to intensively study a problem condition or improvement opportunity to identify the root cause/s.
- To identify all possible reasons for a process going out of control.
- To blend creative thinking with data collection/analysis in the problem solving process.
- To help with motivation in problem solving when the group may have stalled, or simply wishes to concentrate on an area.

Steps

State the problem in a box on the right hand side of the page.

Brainstorm individually, writing down all possible causes of the problem.

Draw a fishbone diagram out of the problem box, with each arm headed by a category. You can create your own category headings, or follow one of the following generic methods.

PIPE: people, input, processes and equipment

PPPE: people, policies, procedures and environment

Place each individual's brainstormed causes on the arm(s) they feel best describes each cause.

If the cause does not allow for action to be taken as "Why does this happen?" Listing the response as a sub branch and repeating the question until a process (which is actionable) is listed.

Can add greater detail with sub-causes, asking who, what, when, where, how, why.

Look for basic causes of the problem:

- Look for causes that appear repeatedly.
- Reach team consensus (e.g. using Nominal Group Technique).
- Gather data on the relative frequency of occurrence of the different causes.

You may wish to use an Affinity diagram rather than the Brainstorming technique. The groups that fall out of this process could form the categories for your cause and effect diagram.

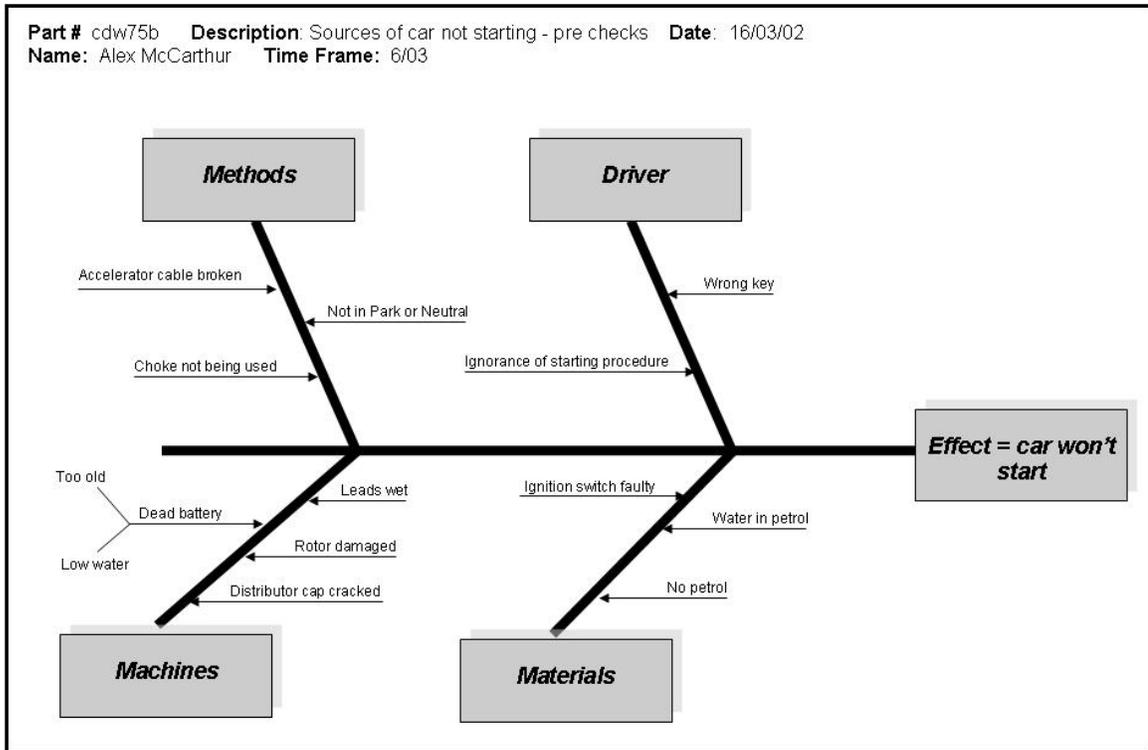


Figure 12 Cause and effect diagram

The Cause and Effect (also known as the Ishikawa or Fishbone) Diagram was developed as a means of helping Quality Teams to analyse the reasons for problems, waste and error in processes. It is a useful way of analysing a problem systematically, clarifying the relationships that exist between various causes and suggesting possible avenues for improvement.

6.1.1.6 Run charts

To display data over time to show shifts, trends and patterns.

Is this the right tool?

- Do you need to show changes in data over time?
- Are you unsure of how to use the Control Chart, but need to collect some initial data?
- Do you want to measure one variable over time?
- Is the data that you are collecting sequential?
- Is the measured activity believed to have regular cycles?

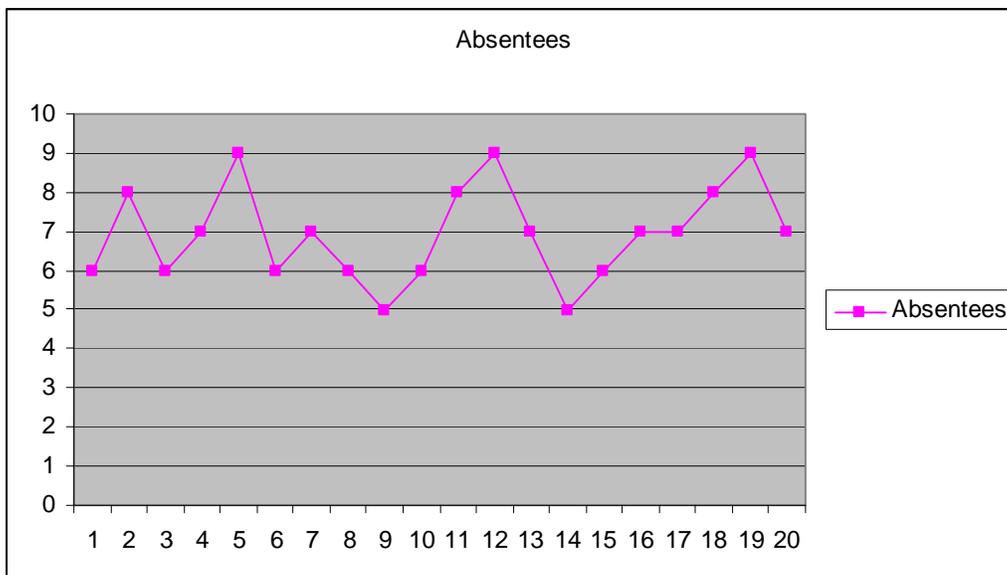
Steps

A run chart can be constructed for the number of employees absent from duty per day over a 20 day period using the following data.

Table 5 Absentee Data

Day	Absentees	Day	Absentees
1	6	11	8
2	8	12	9
3	6	13	7
4	7	14	5
5	9	15	6
6	6	16	7
7	7	17	7
8	6	18	8
9	5	19	9
10	6	20	7

The following diagram is based on the above figures in the grid, showing the day on the horizontal axis and absentees on the vertical axis.

**Figure 13 Run chart data on a grid**

A run chart like the one above can show us how much the result of a process varies from one period to another and can suggest whether these are trends developing and perhaps even whether there might be Special Causes of variation at work in the process. It is further evidence of the value of charts and the ease with which we can visually draw meaning from graphs.

6.1.1.7 The Control chart

The Control Chart was first used by an American statistician, Dr Walter Shewhart of Bell Laboratories. We use it to identify the extent of the influence of special causes and common causes of variation in a process.

A control chart is a run chart with limit lines, called control lines. We use three lines - an upper control limit (UCL), a lower control limit (LCL) and a centre line (or average line) located between the two limits. A basic control chart looks like this.

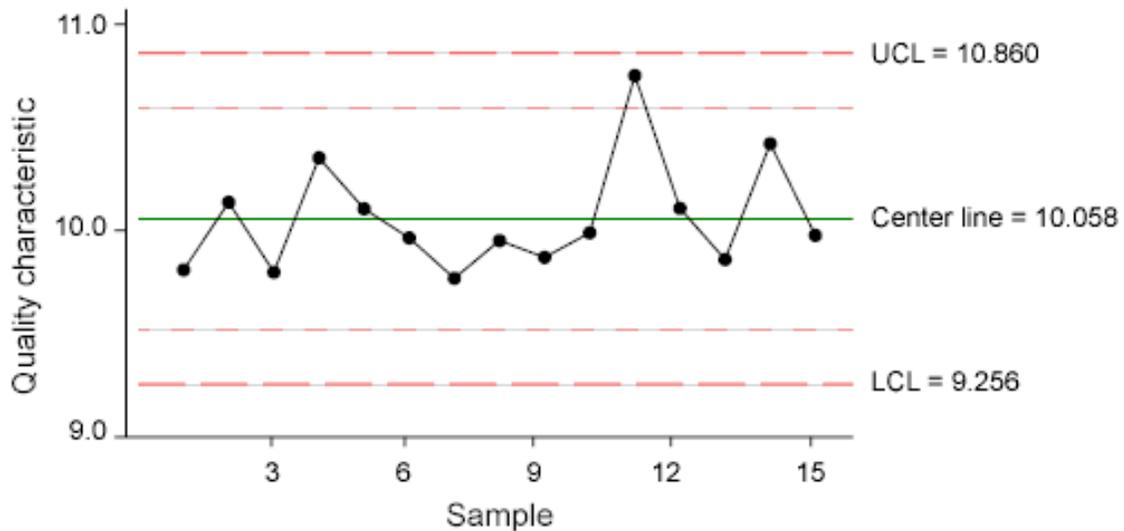


Figure 14 Basic control chart

As stated above, process capability is determined referring to the normal distribution. The centre line represents the mean or average result from the process. The control limits (UCL and LCL) represent three standard deviations either side of the mean.

A control chart tells us whether the process is within statistical control. That is, if it is free from variation due to special causes. Any single point outside the limit lines suggests that a special cause of variation exists. The situation must then be carefully but promptly analysed and if the existence of a special cause is confirmed, it must be removed.

We often want to see what changes in the performance of a process are taking place. We also want to know what effect the various factors in the process have on the result. The information needs to be capable of being acted upon by those keeping data.

Note: always keep in mind that control limits are determined by the data you collect whereas specifications are set separate to the process - usually by the customer.

Control charts are helpful because:

- They give us reliable information on when to take action and when not to.

- They help to separate the effect of special causes from the effect of common causes, and tell us whether they are able to be corrected locally or requirement management's attention and a change to the design of a process; this helps us direct our problem-solving efforts.
- They help us to achieve consistent quality; performance becomes predictable.
- They are simple to construct, maintain, and interpret without a language barrier.
- They convey information about the process from one shift or time period to another.

6.1.1.8 Pareto chart

The Pareto Chart is used to focus efforts on problems that offer the greatest scope or potential for improvement by showing the relative frequency or size of the problem in graphical form. This method is excellent for demonstration the 80/20 rule (80% of problems result from 20% of the causes).

Use when?

- There is a need to tackle problems in a systematic way, starting with the most important cause (identifies major priorities and areas).
- Comparing problems using different measurement scales (such as frequency and cost) can help make the decision on where to start.
- Breaking the problem into smaller problems will help identify the root cause.
- A clear easy to read visual will help track progress.
- Looking to fix the majority of a problem by addressing the most common source of its occurrence.

How do I do it?

- Decide which problem to work on.
- Choose the causes or problems that will be monitored and compared (brainstorming may assist with this process).
- Choose the unit of measurement to be used (frequency or cost).
- Decide on the length of time you want to collect/study the data for. (It may be possible to gather data from an historical perspective.)
- Gather the necessary data on each problem category.
- Compare the relative frequency and/or cost of each problem category.
- List problem categories on the horizontal axis of a graph.
- Plot the data using a bar graph format. You may wish to draw in the cumulative percentage line showing the portion of the total that each problem category represents.
- The bars are connected and represented in descending order.

Using a pareto chart

The Pareto Chart shows us what the most significant problems are and therefore where we should concentrate our effort if we want to get the biggest early improvement in performance. It is generally easier to make significant changes to the factors represented by the tallest bars than to gain the same benefit from the small bars. Where we have limited resources the Pareto diagram helps by suggesting how we can use those resources to best effect.

We can often get a very useful version of the Pareto Chart, by using a scale expressed in dollar value rather than one that uses just a scale expressed in numbers of items.

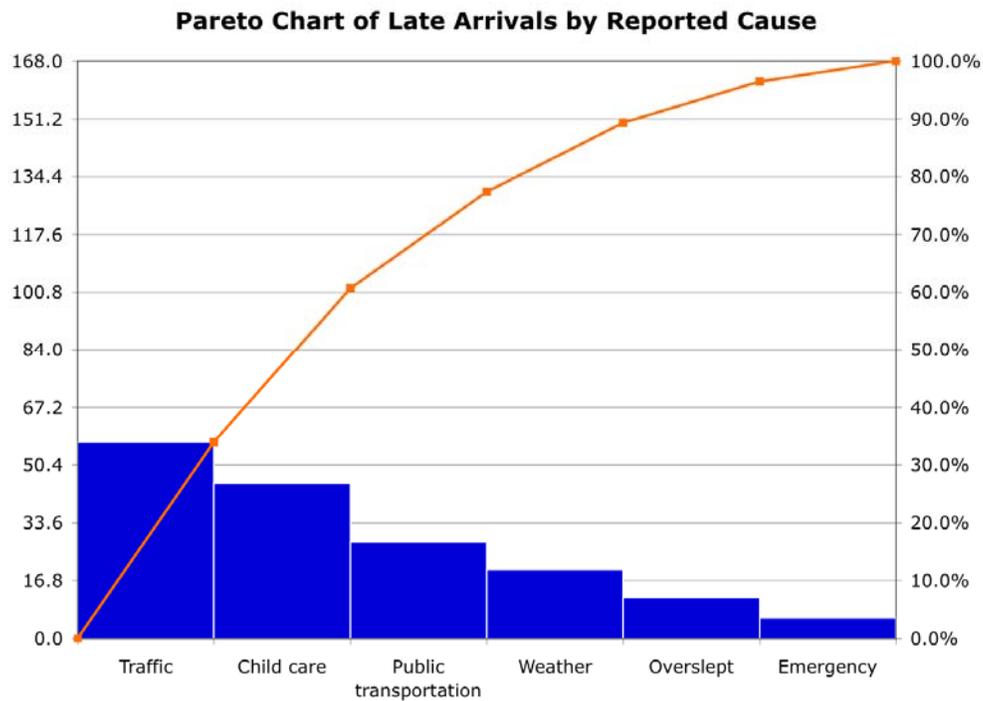


Figure 15 Pareto Chart

Constructing a pareto chart

When constructing a pareto chart follow this procedure.

1. Clearly define the problem being investigated.
2. Decide whether to express data in terms of total number, dollar value, percentage for each factor etc.
3. Collect data on check sheets.
4. Sort the data into the various factors.
5. Arrange the factors in a table in descending order of importance.

6. Draw horizontal and vertical axes.
7. On horizontal axis mark of equal intervals, one for each factor, writing in the most important factor under the first interval, the next more important under the second interval, and so on.
8. Combine minor factors in an "All Other" interval at the right-hand end.
9. Select the appropriate scale on the vertical axis.
10. Draw in the vertical bars.
11. Title the chart and write in details on source of data, total number of readings, date, name of compiler etc.

6.1.1.9 Force field analysis

A tool that helps a team identify the forces at work in a given situation. The underlying assumption of the force field concept is that every situation results from a balance of forces, restraining forces and driving (helping) forces. Restraining forces are those that keep the situation from improving or changing, whereas driving forces are those that help push toward the achievement of the goal. This analysis gives us a better picture of the relative merits of a possible situation or solution.

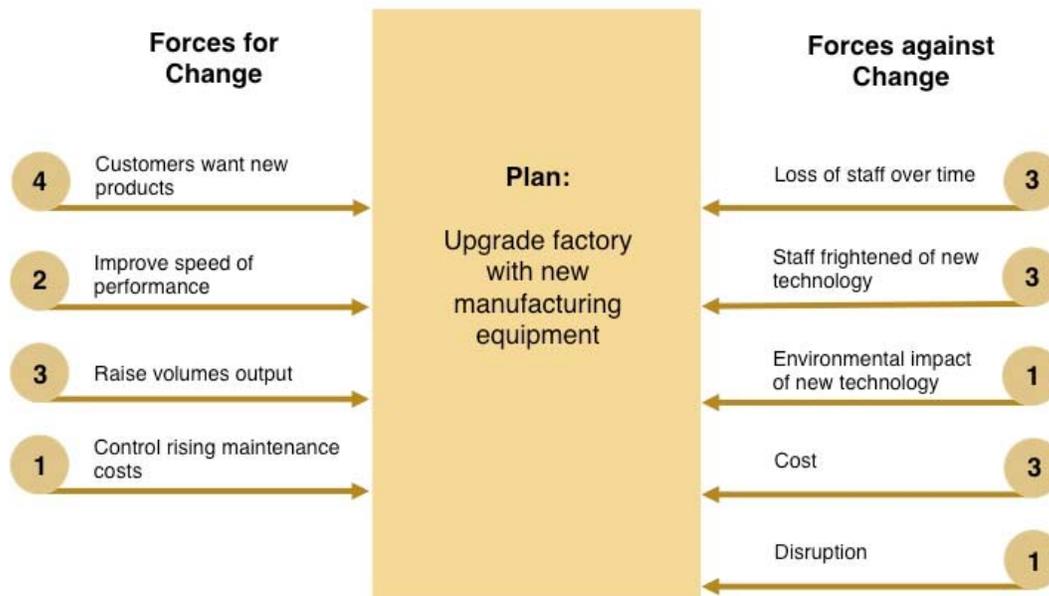


Figure 16 Force field

Use when?

- There is a need to evaluate a situation or available alternatives.
- There is an issue or problem that requires better definition.
- Where there is uncertainty about what conditions to change, or is unsure of all the conditions that presently exist.
- There is a need to think about the positive/negative aspects of making a desired change.
- There is a need to identify possible consequences of a desired change.

How do I do it?

- Identify the issue or problem.
- Agree on the change sought.
- Describe how the situation is now, and how it ought to be when the issue or problem is resolved.
- Divide a flip chart or whiteboard into quarters.
- Label the left hand side "Drivers" and the right hand side "Restrainers". Label the top half "Internal" (for those issues that are within the organisation). Label the bottom half "External" (for those forces that are outside of the organisation).
- List in each quadrant the:

- Internal positives that support resolving or can mitigate the issue or problem (internal drivers).
 - External positives that support resolving or can mitigate the issue of problem (external drivers).
 - Internal negatives from inside the organisation that create the problem or hinder the resolution of the problem (internal restrainers).
 - External negatives from outside the organisation that create the problem or hinder resolution of the problem (external restrainers).
 - It may assist to assess the relative strength of each issue on a scale (5 = very strong, 4 = strong, 3 = medium, 2 = low, 1 = weak).
- Generate potential solutions by determining whether to:
 - Increase the number or strengths of helping forces; or
 - Decrease the number or strength of hindering forces.

7 Appendix

The ADRI Framework (Approach-Deployment-Review/Results-Improvement)

Approach: *The Thinking and Planning component*

The Approach write up should be short and to the point with clear objectives and expected outcomes plus planned measures and targets to be used at the Review/Results stage).

Some questions to consider:

- What are you trying to achieve for the item – what is your intent?
- What goals have been established?
- What strategies, structures and processes have been developed to achieve your intent, and why did you choose them?
- What quantitative and qualitative performance indicators have been designed to track progress?

Deployment: *'Implementing and Doing'*

Identifies how the Approach is to be rolled out. This might include relevant policies, training, programs or other specific initiatives. Some questions to consider:

- How have those strategies, structures and processes been put into practice?
- What is the depth and breadth of their implementation throughout the organisation?
- To what extent have they been accepted and integrated as part of normal operations?

Review/Results: *'Reviewing, Monitoring and Evaluating'*

This section must address both the Review process to be undertaken and the actual Results obtained as a result of the Approach and Deployment as identified above. This is the most significant section as it demonstrates what has been achieved and it is here that tables of data, references to reports, committee outcomes, etc, are provided as evidence of results achieved. Some questions to consider:

- What are the trends in the performance indicators for this item?
- How do these results compare with best-known performance?

Give examples:

To what extent are these results indicative of the entire organisation's performance? How do you know that these results flow from the Approach and its Deployment? How do you communicate, interpret and use these results?

Improvement: 'Learning and Adapting'

Identifies how we can do things better as a result of the ADRI process and sets the direction of what will be focussed on moving forward to ensure we 'raise the bar' for the next cycle.

Some questions to consider:

- What is the process to review the appropriateness and effectiveness of the Approach and its deployment for the item? How do you use the Results for the item to do this?
- What have you learned, how have you captured this learning, and how have you used the learning to improve the Approach and its Deployment.

Adapted from: The Business Excellence Framework 2007, SAI-Global.

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