# TRIZ at Bradford University
# Solving a Organisational Problem using TRIZ

It is not good starting the New Year with a sense of foreboding and I was dreading my first two TRIZ courses in 2006. These were at the engineering departments of Bradford University and Sheffield Hallam and I had my southerner's prejudice to northern cities in January. I love teaching TRIZ at universities and my experience of teaching TRIZ to academics has been almost always very enjoyable. Occasionally however there is hostility to TRIZ, as something new to them, from some awkward and vociferous individual and I have previously encountered one or two difficult engineering academics initially very opposed to it all – but who have since become enthusiasts for TRIZ (and good friends).

Academics with TRIZ can be a bit like the nursery rhyme
*There was a little girl with a little curl right in the middle of her forehead*
*When she was good she was very, very good and when she was bad she was horrid.*
To be fair, nearly all the academics I have taught have been very, very good, but one or two have been startlingly horrid and hated the idea of TRIZ supplementing formal engineering training to foster innovation and fast problem solving. There is a suspicion that somehow TRIZ is too good to be true, and anything which guides engineers to quick answers must be quite suspect.

I have also had some sticky moments at some public TRIZ lectures from furious and shocked engineers who refuse to believe that TRIZ shows how there are just 40 ways of solving most engineering problems. Most come round to TRIZ, once they look at it and try it, but it still threatens some. One training manager I know in a military establishment still actively fights to prevent TRIZ being taught again in his organization – despite their new TRIZ patents and an active and successful TRIZ group.

Most academics we have taught have taken TRIZ to their students enthusiastically because it helps them see the big picture in engineering and to approach projects systematically, and put their other engineering tools in context. When I was a Governor of Coventry University I encouraged TRIZ and for some years TRIZ has made its mark at Coventry and has been available on postgraduate courses through Dr. Peter Griffiths and others. We also taught the TRIZ Biomimetics group their first TRIZ at Bath University, under Professor Julian Vincent, and found them very receptive to it all. They are now very active in the TRIZ community with published papers, much research and fascinating results.

**Problem Solving with TRIZ**
Until TRIZ there have been no effective problem solving toolkits; there have been many so-called problem solving toolkits but they only help us analyse problems and to rank solutions; the actual finding of solutions is left to us to find from our own brains, often assisted by some form of brainstorming. Also many of these traditional 'problem solving' methods are too tedious and longwinded to be used everyday and for fast problem understanding. They take many forms, under many names and have been developed in the past 50 years with many recent re-launches of these old toolkits under new names.

The benefits of TRIZ, with its unique problem solving tools, stretch far beyond the old toolkits' capability. TRIZ is fast and takes us to new solutions we wouldn't probably otherwise have reached. TRIZ also offers us clarity of thought and thinking tools to shake up our brains and memories for solutions we know (and want to remember) and a mental approach to effective problem solving to find solutions we don't know. TRIZ also has tools for fast understanding and communication of complex information about problem situations. This often leads to seeing quite obvious solutions (which were eluding us) and being clear about which directions to take. The power of each of these tools is that they are simple to learn, use and show to others.

Uniquely TRIZ has good problem solving tools particularly for solving contradictions, improving inadequacies and dealing with harm – all useful with or without brainstorming and all fast and effective for finding a good range of effective solutions.

Bradford and Sheffield of course turned out to be hugely enjoyable, challenging and very rewarding for me. Both courses were delightful, both the Cities and the Universities were a fabulous surprise, and the academics were all open-minded, enthusiastic and excited by the TRIZ tools and process. I learn something new on every course I teach but these

made me think hard about the nature of engineering teaching, and what we need for our future engineers.

The Bradford group immediately wanted to apply TRIZ to their most pressing and important problem – their future and how to get more good, mathematically able, local students to apply to Bradford University's (excellent) Engineering Department. This involves looking at the future directions of engineering teaching at Bradford and the best future structure and resources of the department itself. We are now using TRIZ to look at this problem and structure our approach to tackling this problem.

**TRIZ at Bradford**
At Bradford we first looked at how to use TRIZ to approach their problem of attracting more local students to their excellent **accredited** engineering courses. Bradford has a well established, good reputation for producing good engineers. Employment prospects are excellent for their graduates and they attract good students from all over the world.

This problem solving with their team has only just begun and we hope to use TRIZ over the next two months to look for clear and detailed solution directions. I would like to show you how we have begun the process and at a later date show the progress of the problem solving with TRIZ on a very general and important problem.

**The Background to the Problem**
The problems facing Bradford are similar to those of all universities with good engineering departments - and to the old on-going problems have been added new ones. Changes in government policies, to ensure that more young people consider university, have created many of the new problems. The trend is towards fewer grants and more fees, together with a squeeze on university funding while student numbers rise. One solution the government is encouraging is that more students go to university in their home town – with a planned target of 40% of students living at home. This may be fine if your local university offers the course you want - otherwise are universities under pressure to meet new local demands rather than continue with their traditional strengths? Or will students be obliged to study at the local university whether or not it is appropriate to their aspirations and abilities.

I studied mechanical engineering at Imperial College in the 70's where there were about 4000 students on the South Kensington campus. There are now more than three times that number of students on the same campus, and staff/ student ratios have changed dramatically but standards remain as high if not higher.

It is the same for most of our universities – facing the problems of how to attract more students and turn out many more good engineers without increasing staff numbers or facilities. Solutions such as reducing teaching time in the new 2 semester system, and sending students home for reading weeks, have been introduced in many universities.

**The old problems include issues like:-**
How to reach and inspire mathematically able teenagers who are initially attracted to engineering and probably know little about it?
Engineering (similar to subjects like music) needs ability, staying power and enthusiasm to succeed as it has great depth and the training is rigorous – how to ensure that students survive and flourish throughout such demanding courses?
How to attract more women? (The numbers seem unchanged since my day, sadly)

To begin looking at the Bradford University Problem we have to understand the following

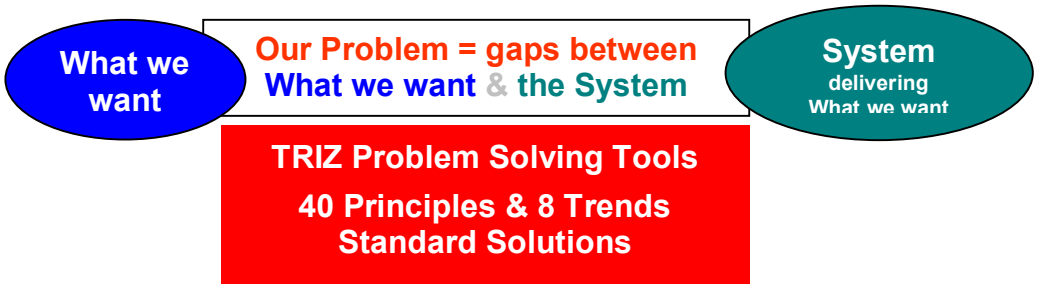
- The Problem
- What we want
- How we deliver what we want (the System)

The following is a brief guide to how TRIZ will help us.

**Using TRIZ to help us solve problems**

TRIZ is a set of powerful tools which help us

- Understand, list and prioritise what we want (all our requirements/ benefits)
- Understand, analyse and map the right systems (and locate the right systems) for delivering what we want
- Get the system right - Identify the problems and the causes of the problems (remove or reduce the gaps between our requirements and the system)
- Define HOW our system doesn't deliver what we want (harms, insufficiencies, excesses or contradictions) to see which problems to solve and which order to solve them in.
- Solve the Problems with TRIZ to get the right system right to deliver our needs




Everything we do involves delivering WHAT WE WANT by some kind of SYSTEM. Often the **system** delivers some of **what we want** but not everything - whenever there are gaps, there are problems; whenever the system delivers more than we want there are problems like cost and complexity; therefore problem-solving is needed whenever and wherever our system does not deliver exactly what we want. This applies to all problems be they technical or management or any problem in life.

So to start solving the Bradford Problem we need to define

**What we want** - benefits
**The System** (we need to find the right system level)
**The Problem** = the gaps between benefits and the system

**The Problem**
In TRIZ it does not matter in which order we define each of the three – which is just as well because in real life we come at problems from many different places. At Bradford we started in the usual place with the problem.

We defined
**The Problem (and its context)**
**What we want** = outcomes we want (we being the staff of the engineering department)
**The System** (the engineering department of Bradford University)

**Using TRIZ for Problem Understanding**
Understanding the problem in context helps us subsequently to understand what we want and how the system fails us - the causes of our problem. This is a long-term problem probably with long-term solutions so we examined the context of the problem – and looked

at where we are now, how this has changed in the last 5-10 years, and where we want to be in the next 5-10 years.

The TRIZ tool for this is the 9 Windows Tool for Problem Understanding and setting our problem in a clear context of Time and Space (this tool is also known as Thinking in Time and Space). The first three questions below are essential to understanding what we are doing and why and are written in a simple 9-Windows chart.

***What is the Problem? State overall Problem with this system***
Write in PRESENT central box of 9 Boxes
Top of the head answer, don't agonise - we can re-define later if necessary

***History of Problem***
Write in PAST central boxes

***What is the end result we want?***
What are we trying to do? What Solution would we like? Write this in the FUTURE Central box.

| | PAST | PRESENT | FUTURE |
|---|---|---|---|
| **SUPER-SYSTEM** | | | |
| **SYSTEM** | Engineering is less understood in schools and is not a popular choice? Qualifications are harder than other courses? | **How to attract many capable engineering Students to Bradford?** | Full quota of good students graduating in engineering from Bradford<br><br>Many local to North East UK |
| **SUB-SYSTEM** | | | |

We can then fill in as many of the other boxes as we have information relevant to the problem. Any big picture issues, such as government policies, university changes, cultural issues we put in the SUPERSYSTEM Windows and the details about students etc. in the SUBSYSTEM Windows.

The 9 Windows helps us sort all the many facts and different influences on the problem at the different levels. The 9 Window Tool is supposed to be a quick, rough and ready sorter of our relevant knowledge to help us understand the problem in context and communicate it to others. We shouldn't worry too much about getting exactly the right information in the right boxes. To use our brains effectively it is better that we keep moving quickly in order to see the whole picture and not get too lost in the details at this stage. (We can fill them in later if necessary)

| PAST HISTORY | PRESENT SITUATION | FUTURE WHAT WE WANT |
|---|---|---|
| Government policy - more graduates<br><br>Low status of engineers in UK<br>UK Manufacturing base in decline.<br>Less Engineering sandwich schemes and industrial sponsorship<br>Apprenticeships disappearing<br>New Universities offer competition<br><br>Engineering compares unfavourably to big City salaries/law/accountancy<br><br>Polarisation in University popularity - Chosen on clubbing and shopping facilities rather than academic? | Government required quota of engineering students at Bradford<br><br>University has experienced loyal, and highly qualified engineering staff and good facilities<br><br>Demand remains high from overseas students<br><br>Local companies need good well-trained engineers | **What will the Government want?**<br><br>**What the University will want?**<br><br>**What will Bradford want?** |
| Long established and good reputation for engineering at Bradford University<br><br>Engineering less understood in schools - not a popular choice?<br>Maths taught differently<br><br>Other practical courses like business studies become popular<br><br>Engineering courses male dominated - both students & staff | **PROBLEM**<br><br>**How to attract many capable engineering students to Bradford University?** | **WHAT WE WANT**<br>**Prime Output**<br><br>**Full quota of good students graduating in engineering from Bradford University**<br><br>**Many local to North East of UK** |
| Entry Qualifications seen as harder than other courses?<br><br>Maths and Physics A level standards lower than before but still harder than most other subjects?<br><br>More girls at university with better GCSE's than boys (including maths) but IT and engineering increasingly seen as geeky boy subjects | How to help ensure there is a good pool of able students available?<br>(Good maths needed – do many at school lose maths confidence and ability before the age of 16?)<br><br>How to overcome ignorance about engineering and inspire enthusiasm for engineering amongst those not previously or yet interested? | Students gain employment from local companies |

The information above covers the work done so far at Bradford. The rest of the article lays out the structure of the future problem solving with TRIZ at Bradford, specifically to ensure a sufficient throughput of good students.

**How to use TRIZ for the problem at Bradford University Engineering Department**

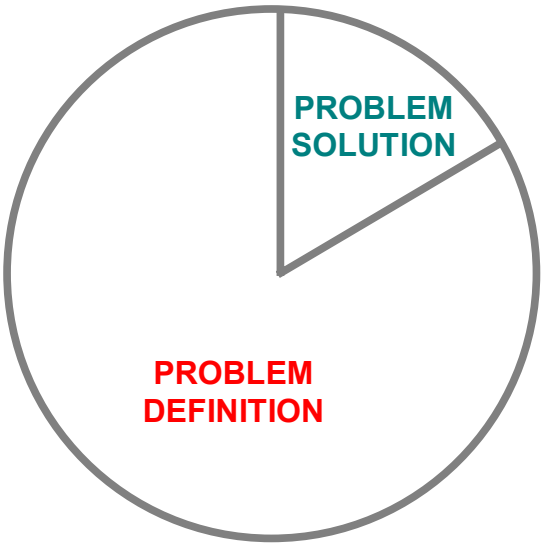
**Successful Problem Solving requires the following**

- define the problem (& understand why it is a problem)
- define what we want (all benefits)
- define and understand how we can deliver what we want (with the system and its resources)

and then use all of the above together with our brains to solve the problem.

The problem with problem solving is that as we start this process we think of solutions. Most of us would rather just explore those solutions than step through a problem understanding process before we get to problem solving.

There is a contradiction with many problem understanding methods in that the more comprehensive they are, the more tedious they are, and we are tempted to abandon them and dive straight into solution mode. But there are advantages in fully analysing the problem and this may prove quicker in the long run.




Engineers in particular are less interested in problems than solutions! Start describing a problem to engineers and in less than two minutes they are listening with only a part of their brain, because they have thought of answers and are thinking about their own solutions.

This is normal and often even the problem is described to them in terms of the solution (thought of by the person describing the problem) with something like "We need to do this" or "The problem is this and we could…" or "How can we achieve this?" so that even the person tasked with describing the problems can't resist jumping into solution mode.

Engineers are trained to react to problems by thinking up solutions (unlike scientists - who are apparently better at analysing problems) and often they may not even ask for enough information about the problem because finding solutions is the way engineers almost have fun (do engineers have fun?).

**BEFO**

**RE WE START WE NEED A SOLUTION PARK**

A Solution Park is essential

- to capture all the good solutions we think of when faced with a problem
- to stop us thinking about those solutions while we understand the problem
- to use later - because TRIZ requires us to think of solutions then use TRIZ together with those solutions to either improve them or take us to better solutions

When we are first given a problem we react with great mental agility and creativity; we apply our knowledge and experience and think of good answers because problems nearly always stimulate us to produce immediate solutions.

This ability instantly to see solutions gives us access to our own valuable relevant brain power and experience and involves us in very effective creative problem solving. However when looking for all the good solutions to a problem, we want much more than everyone's first, fast reactions no matter how clever they may be. We want considered thought about a problem, but when we can't help jumping straight into solution mode, then we need to allow that to happen, capture and park all those solutions and then return to the problem. We call this a SOLUTION PARK and it is an essential step in problem solving. We can then enjoy the experience of that initial intense burst of creativity, be excited by the solutions we first picture, and allow our instincts to think of solutions and for a short time forget about everything else.

TRIZ is here for us to locate all the solutions (not just the ones we first thought of) and therefore engineers should not try to resist this first burst of creativity, but use it, record ideas in the solution park, be acknowledged for solution finding and then move back to the problem. TRIZ often needs our first solutions as part of the process for later. However returning to problem understanding needs discipline as we mustn't stay in solution mode if we are to understand the essential information to find all the good solutions to a problem.

**Systematic but fast Problem Solving with TRIZ**
TRIZ has a number of steps for problem understanding. These are designed to be fast and simple (so we don't lose our thread of thought) and we keep using our brains – rather than plodding through detail. Once familiar with these steps they can be very fast indeed.

**Understanding the Problem** Ideal Outcome

The first challenge in TRIZ is to define the **Ideal Outcome**. This is a major TRIZ tool and also known in TRIZ as the **Ideal Final Result**. (This tool helps our understanding while freeing our thinking from constraints) Defining our Ideal Outcome can take some thought but it ensures we understand what we are trying to do.

To truly understand **what we want** we must put aside from our thinking all the ways which are the **HOW** we get what we want, and the attached limitations–such as it being too expensive or taking too long. We must concentrate only on benefits and forget and limits on our inputs such as time and money. It is often difficult however to forget these limitations and ignore constraints and any downsides or harms which may be associated with getting what we want. So we use a mental trick ….

We just imagine we have a magic wand which we can wave to get everything we want. **Everything we want** (without worrying about how we get it) is our **Ideal Outcome**.

Achieving our Ideal Outcome would solve our problem, but even if this is not possible simply by defining and understanding the Ideal Outcome we can see which direction to move towards to seek solutions– so we define our Ideal Outcome without worrying about the **HOW** at this stage.

This is my attempt to define the Ideal Outcome for Bradford – when we do the session live next month we will ask everyone in the room to give us their definition and then define our Ideal Outcome – the result may be different from my answer below

**IDEAL OUTCOME =** Good engineering department with long term future, providing accredited engineering courses, greatly in demand from able students (local included)

Once we have defined it we can use our **Ideal Outcome** for three steps

1. To define who **WE** are (and later we must define at which **system** level we are operating and able to solve problems) – although aware of separate interested parties (other stakeholders) we ignore them at this stage

2. To help us understand **what we want** – the prime output and all other Benefits

3. To help us understand and visualise solutions to our **problem**

We now have to define the following all the following:-

| | |
|---|---|
| **Who are we?** | = WE are the staff (academic and administrative) of the engineering department |
| **Problem** | = How to get an on-going full quota of good students graduating in engineering from Bradford including many local to North East of UK |
| **System** | = Engineering Department of Bradford University |
| **Ideal Outcome** | = Good engineering department with long term future, providing accredited engineering courses, greatly in demand from able students (local included) |
| | This is the main function the system delivers |
| **Prime Output** | = Good, accredited engineering courses delivered to able students (for this exercise we are ignoring other important outputs such as engineering research) |
| **Benefits** | Everything we want the system to deliver |
| **Features** | How we deliver the benefits |
| **Resources** | Everything we need to provide to deliver the features |

Once we have defined our Ideal Outcome and Prime Output then we begin to have choices, especially if we are able to change our system or choose one (if we don't already have one).

We simply ask 'What will deliver our Prime Output?"

*For example if the Prime Output I want is transport to work, there may be several systems to choose between - bike, walking, bus, motorbike, car, taxi etc.*
*Each of these systems offers different benefits with different constraints, costs and harms, and when choosing a system I need to be clear about all of these (such as time, money, safety, convenience, parking ease, dealing with heavy traffic etc.)*

Therefore **how** we can get our **Ideal Outcome** is largely defined by **which system** we can choose. The System is defined by all the benefits it delivers and its costs and harms (inputs and outputs), so our next task is to define benefits - and then define the inputs we need to get these benefits – all the resources we must mobilise.

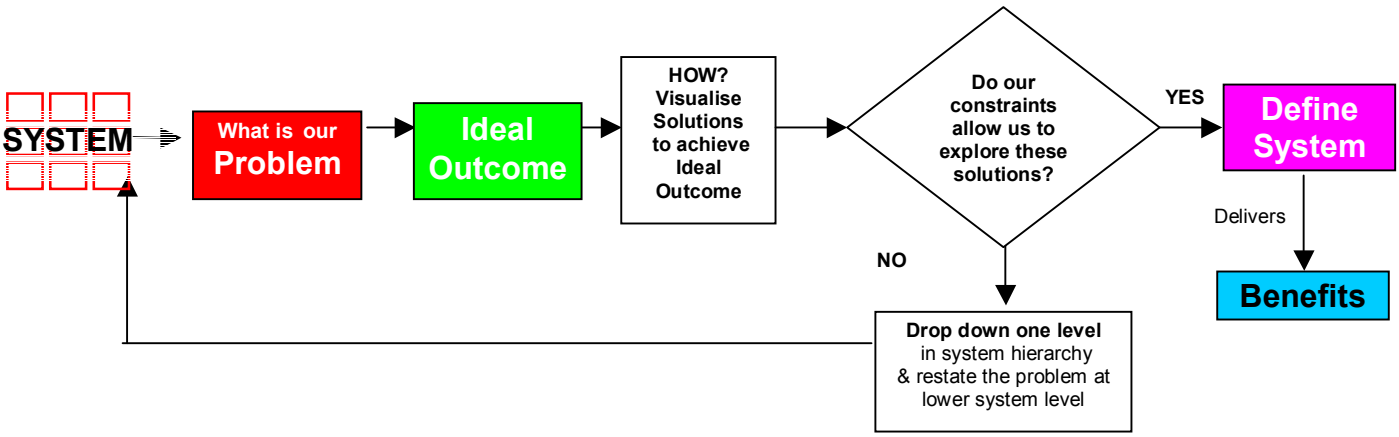
**1. IDEAL OUTCOME for which system level?**
What are the different system levels we could consider?
Where must we / can we operate to be able to tackle the problems?
At which system level can we influence inputs/ constraints?

Government?

Bradford City?

The University of Bradford?

The Engineering Department?

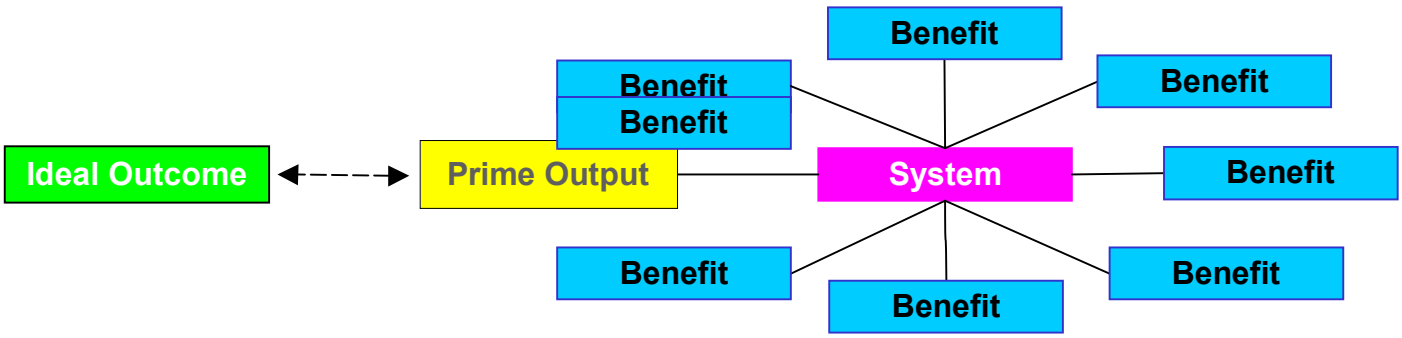



The System level has to be decided and for this we have to understand our constraints.

We have not defined the constraints with the Bradford group and so we cannot exactly determine our system level yet but we will assume that the System Level is the Engineering Department as at this level we can make decisions and have the power to act on and implement these decisions.

Now we have our **System Level = Engineering Department of Bradford University**

Ideal Outcome is also defined by all the benefits we must deliver, so our next task is to define benefits and the inputs we need to get these benefits – the resources we must mobilise. We must now identify the main Benefits we want which would help the System (*the Bradford Engineering Department)* deliver its Prime Output and ultimately its Ideal Outcome.




Benefit

**= High level benefits may include….**

1. A steady and high throughput of able students
2. Good Engineering teaching which is much in demand by students
3. Effective Engineering Research
4. Good facilities
5. Clear, stable, long term targets
6. Secure future for the department
7. Successful, confident and competent engineering department
8. Meet all requirements of the University, the IMechE, the Government

**Defining these benefits may give us an understanding of:-**

The gaps between what we want and what we've got (our general problems)

The general directions we would like to move in

The contradictions between the benefits

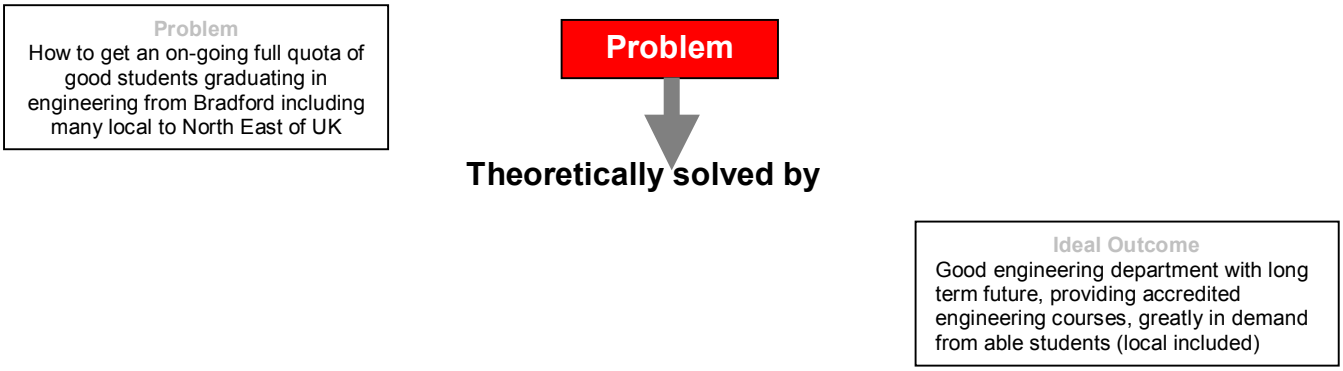
We are not however trying to solve all our problems - we are focusing on solving our specific problem. Coming down from our Ideal we can now probably define on a very practical level (a lower level) what we want. We now need to list the realistic benefits we want to deliver, and to define the ways we deliver those benefits (the Features) and what resources we need.

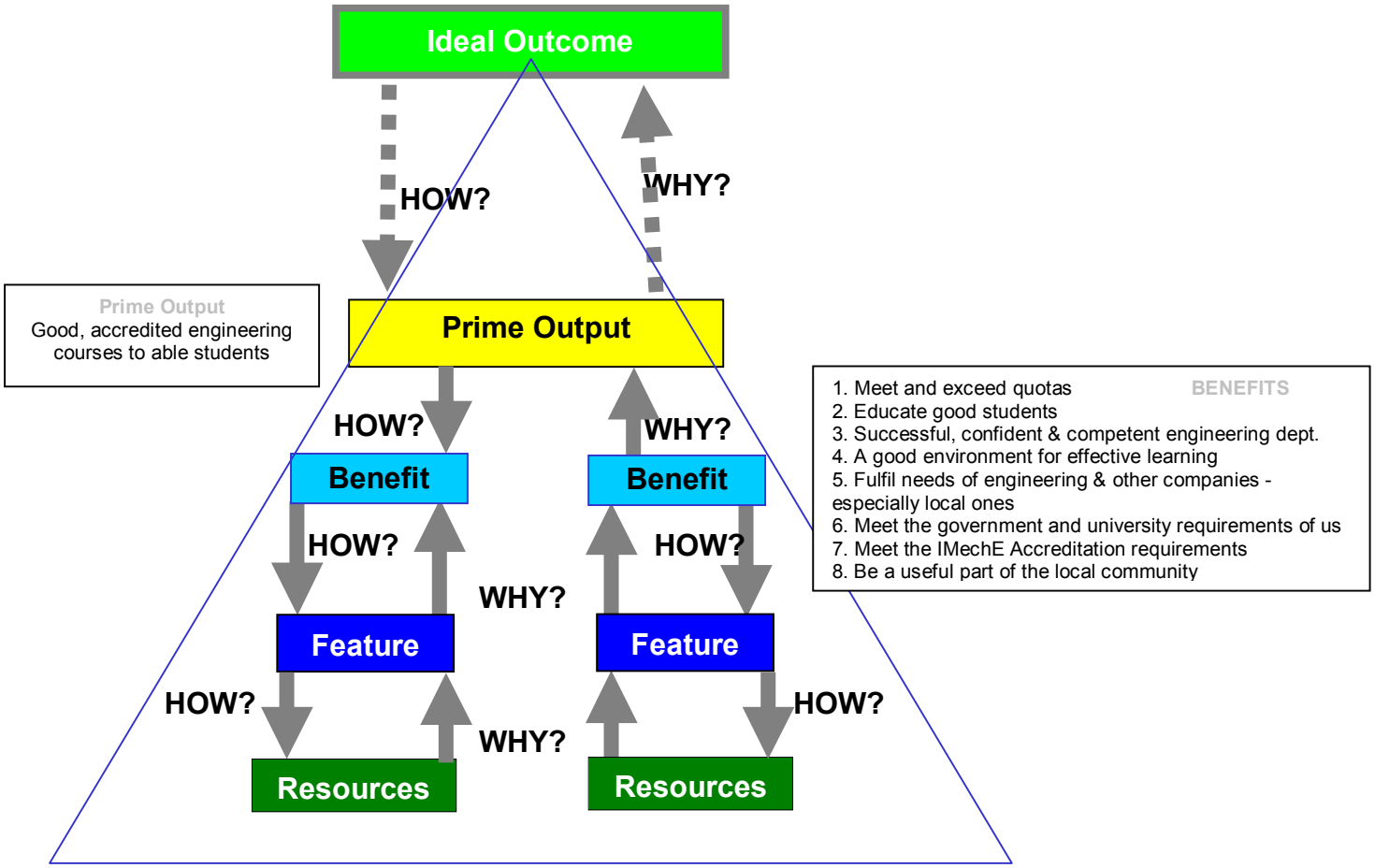
**Benefits we want to deliver - These might simply be…..**

1. Meet and exceed quotas
2. Educate good students
3. Successful, confident and competent engineering department
4. A good environment for effective learning
5. Fulfil needs of engineering and other companies (especially local ones)
6. Meet the government and university requirements of us
7. Meet the IMechE Accreditation requirements
8. Be a useful part of the local community

In the long term solving our defined problem depends on achieving most, if not all, of the above benefits. So we will look at each of these benefits in turn and see HOW they can be delivered and what resources are available. An important part of TRIZ thinking is finding and using resources intelligently. The chart below shows how to move from Ideal Outcome to this hunt for resources.

In this problem essential Resources may include: - An effective, settled teaching team, well equipped engineering department to meet teaching needs, a university managerial support system to provide everything from marketing to students to human resources etc.






**How does the chosen tentative Ideal outcome get us closer to the benefits we want?**

Our Bradford problem relates to how we achieve our benefits with our current system and what are the best means of doing so. In choosing /accepting our system we have to make sure that most of the outcomes it will give us are directly or indirectly connected to the benefits we want. The TRIZ philosophy is to deliver our benefits for the least cost and harm and to do this we must first mobilise all the resources we already have. A good solution in TRIZ is one as close as possible to our Ideal Outcome which uses available resources.

**Benefits** are delivered by **features** which are delivered by **resources**.
*(For example – one benefit Bradford may want is that many students choose Bradford; one feature that may deliver this is that Bradford **is seen as** an attractive option for students as it offers safe, reasonably priced places to live.*

*Resources which already exist for this may include good, inexpensive student accommodation near and on the Campus – mobilising another existing resource such as the marketing department of the University to emphasise to students that what they want is available is a very intelligent use of resources. It just needs an intelligent understanding of what is needed and how to deliver it.*

**We now search for the resources to ensure we can deliver the benefits we want**

Clever problem solving means finding the right inputs at the minimum costs. In TRIZ we need to do a resource hunt to define the resources / inputs we've got and which could be used more effectively (sometimes when combined together)

We need to look at each benefit and see HOW we might achieve them with features, and which resources could deliver the features for maximum benefit and minimum cost.

**Benefits - Features – Resources - See how we can use these to give us best results**

1. Meet and exceed quotas
2. Educate good students
3. Successful, confident and competent engineering department
4. A good environment for effective learning
5. Fulfil needs of engineering and other companies (especially local ones)
6. Meet the government and university requirements of us
7. Meet the IMechE Accreditation requirements
8. Be a useful part of the local community

How can we achieve these benefits with the resources we've got?

1. **Meet and exceed quotas**

**HOW?**
**With Features = Demand** to join the engineering department from capable, motivated, mathematically able, hard working **Students** with enough resources to fund their training who finish the course and get good jobs in engineering

**HOW?**
**Use our Resources =** The engineering department creates this **demand** with their good reputation (well publicised?) and accredited courses.

A local environment which satisfies student needs socially (clubbing and shopping?) and appropriate student facilities for accommodation, student union, social and cultural needs. These need to include good sports facilities, good sports opportunities for able students, good cultural activities (choirs, orchestras, religious needs, etc.) If much of these already exist all we have to do is have good publicity of the right features to the right people -the students (and their parents?)

**Students** are provided with help from our schools, the education system, families, local companies, government education policy, the University etc. If local school children have any shortfalls in maths these could be addressed by the University itself. Resources would need to be found to encourage local school children to learn and enjoy maths to a higher standard with the University through maths clubs etc.

2. **Educate good students**

**HOW?**
**With Features =** Good courses delivered (well) by competent and enthusiastic staff with the right engineering abilities and teaching skills.

**HOW?**
**Use our Resources =** The engineering department with good staff, facilities and many decades of relevant experience and success to choose and retain the best people.

*but we will need to later explore how this may need some changes to meet new criteria and markets.*

3. **Successful, confident and competent engineering department**

**HOW?**
**With Features =** The right staff with appropriate workloads, rewards and experience etc., teaching the right students in good facilities. Good courses (well delivered) by experienced and successful staff. High on-going demand for good teaching, good results etc.
Meet the university's quotas and obtain good feedback from university and industry.
Achieve success in the League Tables and have no abuse from the local and national press (often a problem for individual universities).

**HOW?**
**Use our Resources =** The right salaries, made possible by a supportive university structure for the staff which minimises our problems and unnecessary administration, meetings etc., gives support when needed, responds appropriately to necessary and desirable changes. Staff training is made available when appropriate. Good leadership, good management and good systems, appropriately applied. Good PR and marketing from the University and the department itself.

4. **Good environment for effective learning**

**HOW?**
**With Features** The engineering department with good staff, and facilities - available when needed, attractive buildings and rooms which are well maintained, have good lighting and heating, appropriate technologies and equipment (projectors etc.)

**HOW?**
**Use our Resources =** Sufficient and flexible funding at the right times, supportive University, efficiently run teaching facilities, offices etc. available when needed. Secure environment with few security issues.

5. **Fulfil needs of engineering companies (especially local ones)**

**HOW?**
**With Features =** The right students learning the relevant skills and subjects (may sometimes conflict with (3) above). Good staff relationships with local companies for research and project needs.

**HOW?**
**Use our Resources =** Knowledge and good relationships with local companies, understanding and response to their needs. For example Bradford Engineering department has identified that there will be many complex construction projects on Brown Field Sites in and around Bradford. This is because many local, old heavy industrial manufacturing sites are to be converted to other uses. What skills should the engineering

department be offering for these types of problem – should they consider supplementing present courses and move towards design and architecture?

6. **Meet the government and university requirements of us**

**HOW?**
**With Features =** Appropriate response to quotas, rules, directives etc.

**HOW?**
**Use our Resources =** Staff available to monitor what is needed and good leadership. The engineering department has no direct influence on demanding a sensible government university policy but it has the resource of being part of Bradford University. The university can ask for government guidelines which hopefully don't constantly change and offer trust, and recognition in return for reasonable annual targets on research and personal achievements.

7. **Meet the Engineering Institutes Accreditation requirements**

**HOW?**
**With Features =** The right subjects, in the right proportions, taught to the right level with students passing the courses approved by the Institutes.
**HOW?**
**Use our Resources =** The engineering department and its staff motivated by a desire to deliver accredited courses. This desire for accredited courses is also driven by the individual students who will want to pass accredited courses to become chartered engineers.

8. **Be a useful part of the local community**

**HOW?**

**With Features =** Respond to local company needs, provide a sufficiently attractive environment to build a high quality student population to bring disposable income to Bradford, control student excesses, maintain good local relations with all parts of Bradford society.

**HOW?**

**Use our Resources =** Application of the knowledge of local industry trends and demonstrates that we are trying to actively meet their needs.

Encourage and nourish th**e** existing culture which fosters pride in Bradford and its multicultural society.

Publicise locally and nationally our engineering and academic achievement, and our successes at regulation and monitoring of students. HOST A TRIZ WORKSHOP*

To be continued…….after further problem solving sessions which will move from the Problem Definition and Understanding to Problem Solving? This will involve some detailed analysis of the Engineering Department (with Function Analysis) and the production of a problem list which contains not only all the individual problems to be solved but also the priority of those problems and the order in which they will be solved.

Solving problems with TRIZ is straightforward and involves following the enclosed flowchart overleaf.

*Bradford University is hosting a one-day TRIZ workshop for the Institution of Mechanical Engineers for everyone in the local community, local IMechE members, and local businesses and from the university this includes students, academics, administrators, management etc. This is on 17$^{th}$ May at Bradford Engineering Department.