

UoG / UESTC Joint School of Engineering

Engineering Project Management & Finance

Company Strategy
& Engineering Careers

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- **Company Strategy**
 - What is Strategy?
 - Product Strategy
 - Divisional Strategy
 - Technology Strategy
- **Careers in Engineering**
 - What can you do with an Engineering Degree?
 - Jobs in Engineering
 - Jobs outside Engineering
- **Final Year Projects**
 - How you should choose them...?
 - Short overview of Dr Bremner style of projects

So, what is a business strategy? Strategy is different from vision, mission, goals, priorities, and plans. It is *the result of choices executives make, on where to play and how to win, to maximize **long-term value***.

To define the fundamentals of your business strategy, you need only to answer three questions:

1. Who is the target customer?
 2. What is the value proposition to that customer?
 3. What are the essential capabilities needed to deliver that value proposition?
- Without clear and coherent answers to these three questions you won't have a strategy.
 - [Ken Favaro](#) Booz & Company, [Summer 2012 / Issue 67](#)

You will hear many people talk about strategy or strategic plans. Most people do not know what it means:

- Go back and Read SunTsu's book 'The Art of War'
- Johnson and Scholes ([Exploring Corporate Strategy](#)) define strategy as follows:

"Strategy is the **direction** and **scope** of an organisation over the **long-term**: which achieves **advantage** for the organisation through its configuration of **resources** within a challenging **environment**, to meet the needs of **markets** and to fulfil **stakeholder** expectations".

There are different levels of strategy...

Within Companies:

- Product Strategies (for product families or product types)
- Business Units (for groups of similar products / customers)
- Technology Strategies
- Manufacturing Strategy
- Sales & Marketing Strategies

BUT...

For successful companies they must all fit together like a jigsaw. A effective organization can ONLY have one overall strategy.

How do you develop a strategy?

It is *the result of **choices executives make**, on **where to play** and **how to win**, to maximize long-term value.*

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- From our earlier discussions, a product can be something you sell (a phone, software, a car etc) or a service you offer (design services, expertise etc)
1. Clearly identify who you want your customers to be?
 - Where are they, how much will they spend etc
 2. What are you offering to the customer?
 - What problem are you solving?
 3. What do you need (resources) to provide that product or service?
 - Suppliers, customer skills, support infrastructure, \$\$\$, technology

- Where do you want to be as a company:-
 - A technology Leader (always the latest and greatest)
 - A technology follower (learn from the leaders)
 - How much will people pay for you being ‘first?’
- What technology (or types) are important to you?
 - Do you need to own ALL the technology?
 - What technology is REALLY important to your business?
 - Ideally, own the IP that makes your product different (and hard to copy), and licence less important technology
- Do you (or should you) care about technology at all?

How will you interface with your customers?

1. Who is the target customer?

Young, old, male, female, rich poor?

2. What is the value proposition to that customer?

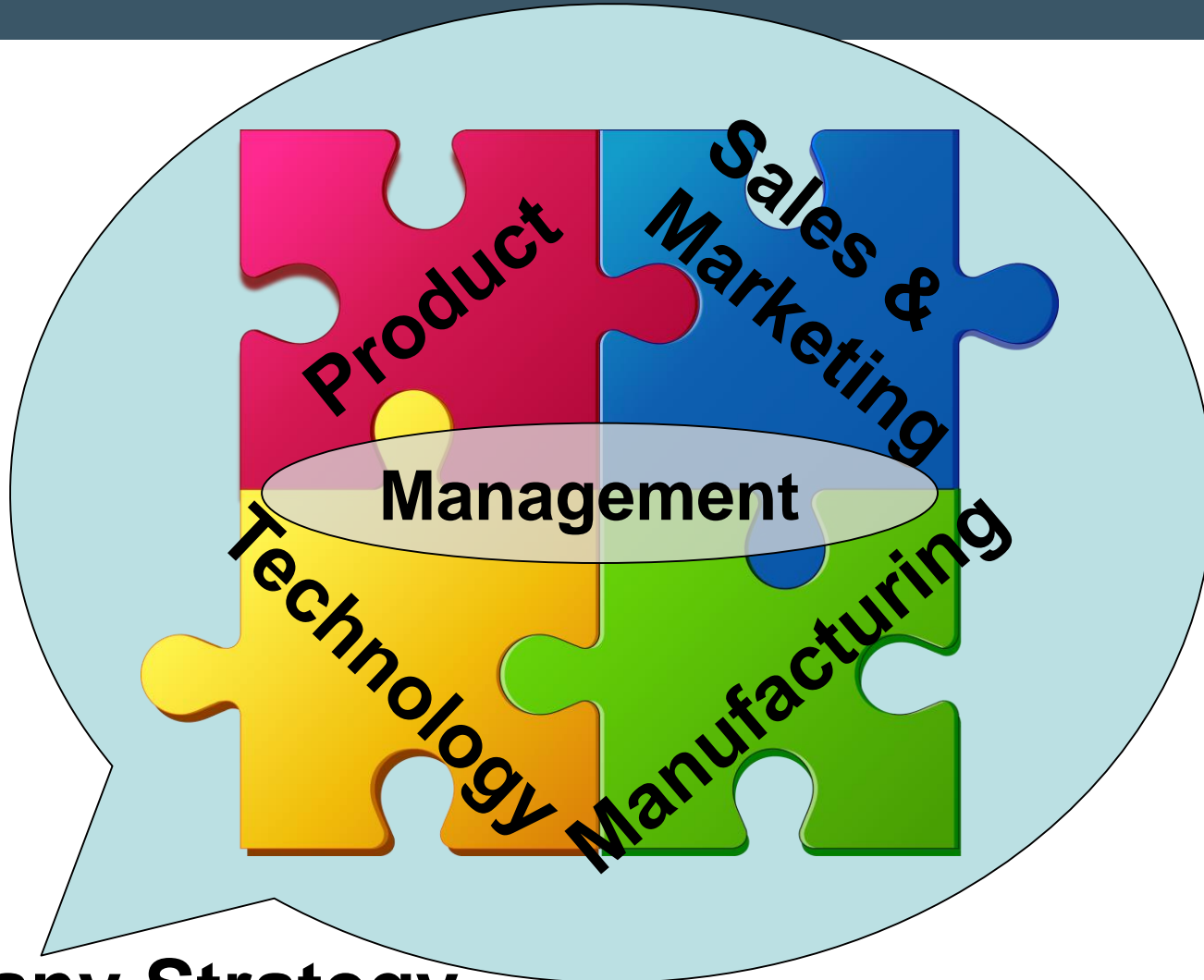
Save time, save money, do something new?

3. What are the essential capabilities needed for you to deliver that value proposition?

Technology, Service, low cost, good infrastructure



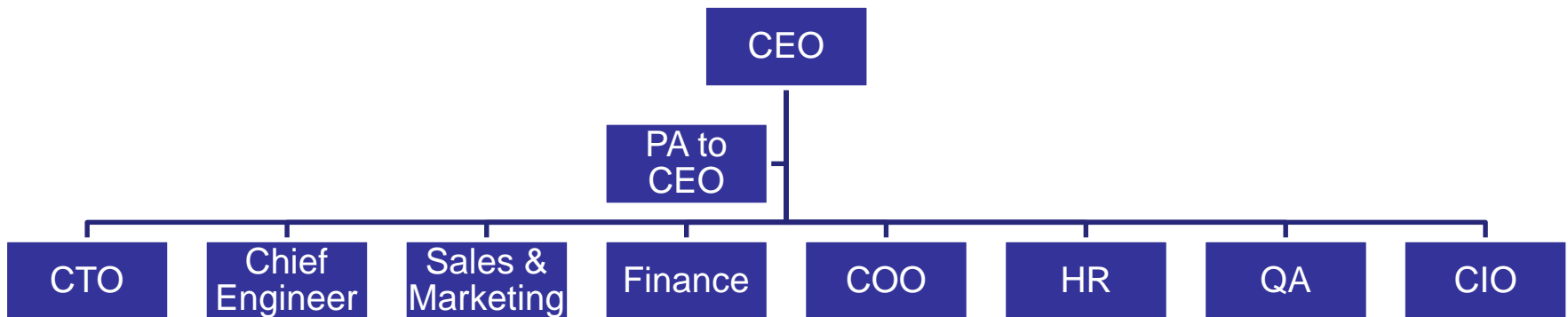
An organization's strategies must interlink...



Company Strategy



Who owns the strategy?



- A strategy is about thinking **Long Term**
 - Where do you want your company to be in 5, 10, 15 years time?
- We have talked about **Company Strategy** but this thinking can be applied to many things
 - Countries: China's 13th five year plan
 - Universities: University of Glasgow: Internationalisation strategy
 - **YOU**...Where do you want to be in 5, 10, 15 years?
- **You** must take charge of your own destination /future...

1. Become a professional Engineer in Industry
2. Become an academic studying Engineering
3. Use your Engineering Degree in another Career
4. Do something completely different !

When you graduate you will be able to:-

Define problems, Analyse Problems, Be highly numerically and computer literate, Be capable of very 'pure' logical thought, Come up with innovative solutions

These are VERY attractive skills for many careers.

There are 100's of different engineering roles Industry

Role

- System Architects / System Engineering
- Design Engineers (SW or HW)
- Test Development Engineers
- Test Engineers
- Manufacturing /Production /Equipment / Plant Engineers
- Assembly Engineers
- Quality Engineers
- Sales Engineers
- Applications Engineers

Industry

- Semiconductors
- Software
- Automotive
- Aerospace
- The Military
- Consumer Equipment
- Medical Equipment
- Food / General Manufacturing
- Power Industry
- Transport Industry
- Communications / Broadcasting

Try and think what will be 'important' in 10 years time...

- Become so interested in an aspect of technology of engineering you want to study it as a career
- The boundaries between Scientist and Engineer become blurred as an academician
 - You are focused on discovering the LIMITATIONS of something
 - Less focused on making products or revenue
 - Your Goal is to publish high quality research papers
- You have the opportunity to make break through discoveries
- Academic life is very competitive; they only choose the best

- Your Engineering Training make you HIGHLY desirable by many other careers:
 - You are the most applied mathematically skilled people around. **WAY** more math skills that accountants / finance people
 - Second to Computer Scientists, you know more about computing than anyone else. You know more about how computers work than anyone on the planet!
 - You **have been trained** to analyse very complex problems to make them easier... and then explain them to others
 - Engineering is a 'team sport', you understand ho to work and rely on others
- Only Doctors work on more complex machines
 - 18-core Intel Xeon E7 = 5.6Bn transistors... and every one works!

Do something completely different!

- You've had enough of engineering; you want to get out!
 - Musician, Sculptor, Painter
 - **Wait... What about all that Innovation training?**
 - Writer, Lawyer, Journalist
 - **Wait... What about presenting a logical argument in written form?**
 - (Thank you Dr Bremner...😊😊)
 - Butcher, Baker, Farmer, Restaurateur
 - **Wait... You understand simple accounts, and how money works**
 - **You can analyse and solve problems**
 - Marketing, Sales, Property Developer
 - **Wait... Market projections, sales growth, Return on Investments**
 - Oh Dear... Sounds like Professional Practice all over again...

- This is the culmination of your Undergraduate Engineering Education
- It is **your** chance to **demonstrate** what you have learned
- We want to see **your** ‘mastery’ across the curriculum
- When you choose a FYP remember:-
 - It is **YOUR** project, pick something you are **interested** in
 - Think about the parts in the course you are best at; show us you working **at your best**
 - You can use your FYP when you go for a job interview. Industry people **love to hear** about new ideas / inventions. Bring a 3 slide presentation to your interview: **show** you are interested.

- I try and structure my projects in a very open way; lots of space for the student to **make it their own project**
- **This Year:**
 - Home Automation System; A Network Audio System; A Remote Self-Powered Weather Station; A Robotic Land Survey Vehicle; A Photonic Theremin.
- **Common Threads in my projects:**
 - The Internet of Things, the connected home, and local area networks
 - Mixed signal system and circuit design for low power applications; particularly in IoT and wearable applications (also audio)
 - Widely distributed, low cost sensor arrays for environmental monitoring
- **Common Outcomes**
 - All the students have modified the projects to make them their own
 - All projects create something tangible they can talk about in interviews

- Read the following:

- ★ – Education and Careers 2000; Enhanced Skills for Engineers; Hissey, T. W.; Proceedings of the IEEE, Vol. 88, No. 8, 2000

Skim

Read

Understand

Critique