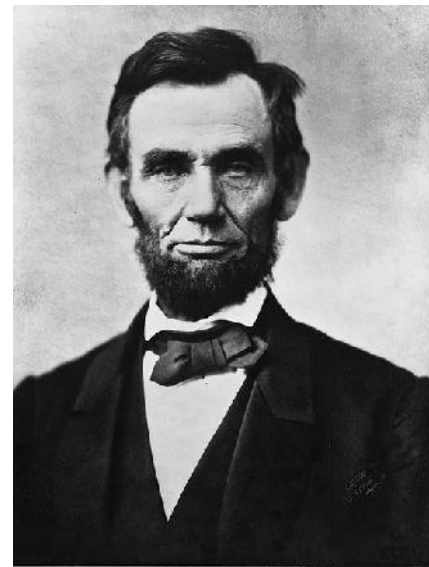
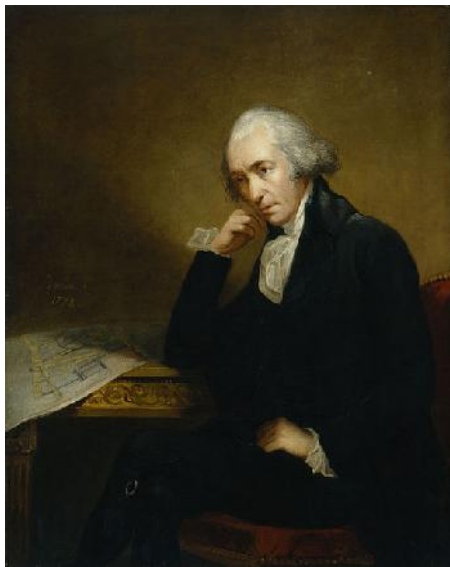


# Cash Flow Driven Development

BCS Edinburgh October 2013



Sources: wikipedia.org

Clarke Ching, Agile & Theory of Constraints Expert

# Calibration exercise

## Three Projects

A B C D E F G H I J

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

i ii iii iv v vi vii viii ix x

## Two Ways

1. Work on 1 project at a time

A B C D ...

2. Work on all three projects at a time.

A 1 i B ...

How much of your capacity is wasted?

5% 10% 20% 30% 40% ????

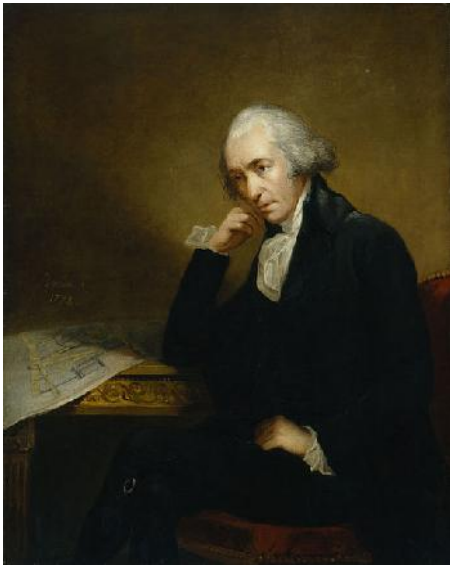
Shop

Create

Sell



# Introducing: James Watt



Source: [wikipedia.org](https://en.wikipedia.org/wiki/File:James_Watt_1771.jpg)



**James Watt**  
1736 - 1819  
Scottish inventor and  
mechanical engineer.  
Unveiled in 1832, his statue  
was the work of Chantrey.



# His greatest invention?



[http://en.wikipedia.org/wiki/File:Grazebrook\\_Beam\\_Engine.jpg](http://en.wikipedia.org/wiki/File:Grazebrook_Beam_Engine.jpg)

This is a Boulton & Watt beam blowing engine re-erected on the Dartmouth Circus roundabout, on the A38(M) in Birmingham, UK.

It was built in 1817 and used in Netherton at the ironworks of M W Grazebrook.



**Michael**

My father made  
him an offer he  
couldn't refuse.

**Kay**

What was that?

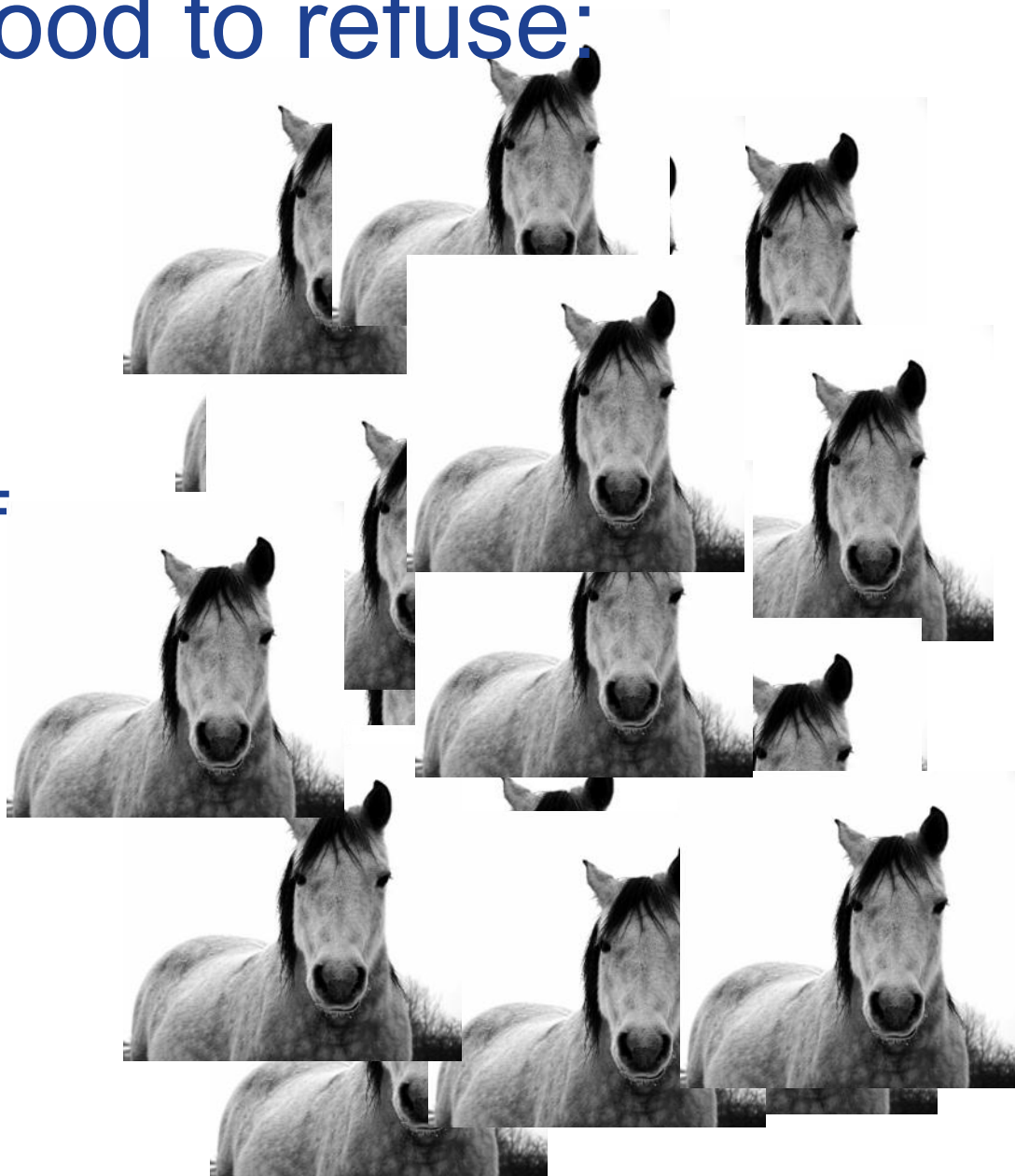
[http://en.wikiquote.org/wiki/The\\_Godfather](http://en.wikiquote.org/wiki/The_Godfather)



# An offer too good to refuse: Horse Power



=

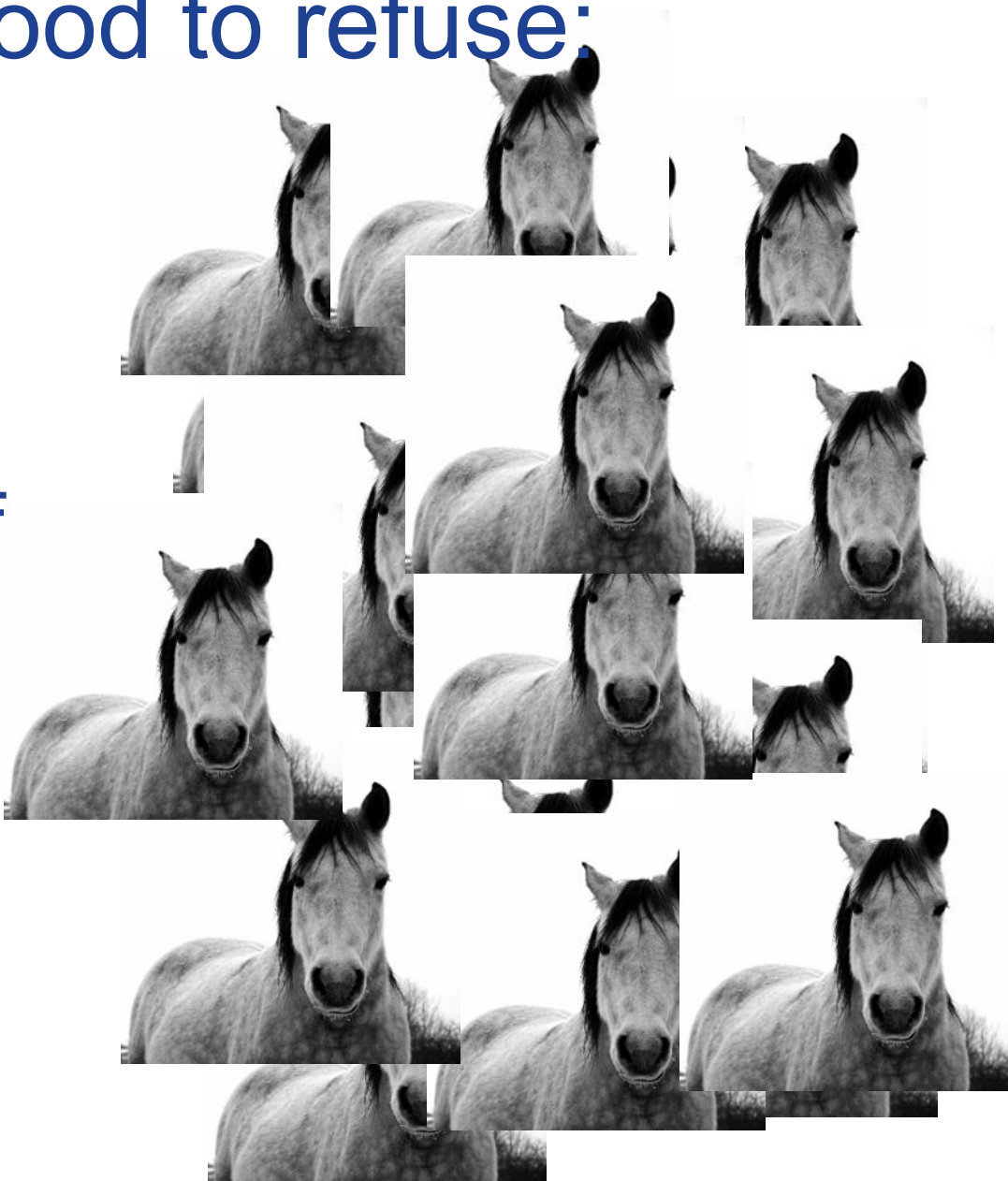




# An offer too good to refuse: Horse Power



=



**= 30 HP**

Which currently costs you £900 p.a..

I'll charge you £300 p.a.,  
saving you £600 p.a..

If you sign up for 20 years.

*"People don't want to buy a quarter-inch drill. They want a quarter-inch hole!"*

- Harvard Business School marketing professor Theodore Levitt.

What's our equivalent of Horse  
Power?

## Quiz – More staff for free? More money?

What happens if you finish every project 25% sooner?

Before: AAAABBBBCCCC

After: AAABBBCCCD

You gain 33% more staff, for free.

(Which is worth Wage-Bill \* 33%)

You can do 33% more work, for free.

But do you have 33% more work to do?



## What if you “sold” or “used” only **half** that 33% increase?

Fixed Costs £2,000,000

Revenue per project £800,000

Before: 3 projects £2,400,000

Profit: £400,000

But now you can do 4 projects!

But you can only sell a small one, bringing in revenue of only £400,000.

Your revenue goes up to £2,800,000

Your profit £800,000

**Your profit has doubled!**

**You are a hero!**

And facilities can afford better  
beans for the coffee machine ...  
or ...

Focus on Cash Flow  
by

Focusing on Project Flow  
by

Eliminating Multitasking.

Let's ignore the switching cost...



# The True cost of Multi-tasking...

- **Blue** resources specialise in the earliest 3 tasks – A,B,C, 1,2,3, i,ii,iii
- **Yellow** resources specialise in the middle 4 tasks and,
- **Green** resources do the last 3 tasks.

So, our projects look like this:

Project 1    A   B   C   D   E   F   G   H   I   J

Project 2    1   2   3   4   5   6   7   8   9   10

Project 3    i   ii   iii   iv   v   vi   vii   viii   ix   x

Let's also assume that each project has it's own project manager.

There is one more, very important, thing we need to discuss to make this real:

## Why are we doing these projects?



Let's say that these three projects fulfil real business purposes with real financial benefits:

Project 1

A new product which earns £10,000 per week, once live.

Project 2

Once delivered, saves £8,000 per week on postage.

Project 3

Fixes a known defect in one of our "live" products which currently causes support costs of £5,000 per week (& decreased customer satisfaction). We'll save £5,000 per week once delivered.

These £££££ are the BENEFIT of finishing the projects.

You can also think of these numbers - £10K, £8K, and £5K - as the **COST of DELAYING** these projects by a week.

# 1. Ideal scenario, no shared resources

Resources: x3 x3 x3

P1     A B C D E F G H I J     20 weeks\*

P2     1 2 3 4 5 6 7 8 9 10     20 weeks\*

P3     i ii iii iv v vi vii viii ix x     20 weeks\*

Each project proceeds independently .  
They'll finish at the same time.  
Cash Flows at the same time.



## Cash Flow

\* Each task takes 2 weeks to complete

# Shared Resource, No Multi-tasking

Sadly, in the real world we have to share resources. ☹️

- Say, we only have 1 of each type of resource.
- We still have 3 project managers.
- And they each want their projects to start immediately and keep moving.

But ... we also have a commercial manager who prioritizes the projects to maximise cash flow.

Let's call this person a FLOW-MASTER. **Flow-masters hate multi-tasking**

## 2. Shared-resources, Single-tasking

Resources: x1 x1 x1

The flow-master wants the cash from project 1 to flow first.  
So Blue sticks with P1 until complete.

P1     A B C D E F G H I J     20 weeks

P2     1 2 3 4 5 6 7 8 9 10     28 weeks

P3     i ii iii iv v vi vii viii ix x     36 weeks

And then, after handing off to Yellow, who starts work on P1, Blue moves to P2, the next most important project.

This is single-tasking!

Notice the cash flow:

£ £10K/week

£ £8K/week

£ £5K/week



# Shared Resource, Multi-tasking

Let's take away our FlowMaster and let the project managers prioritize between themselves.

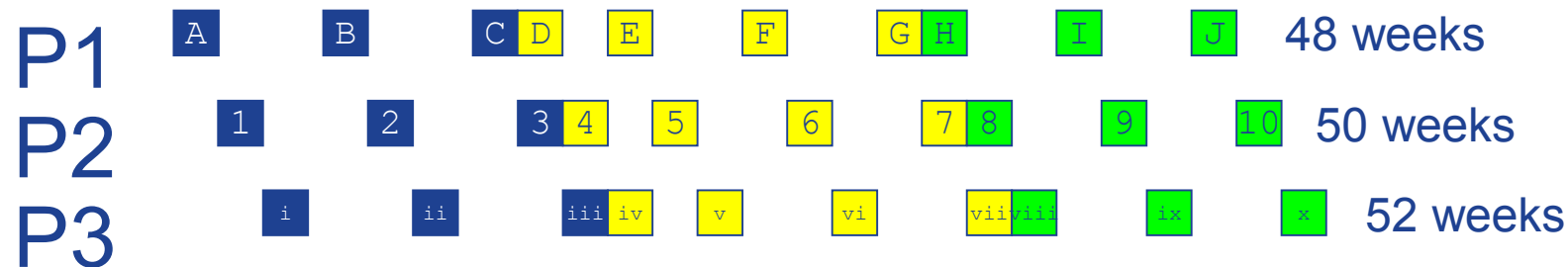
- So we still have 1 of each type of resource.
- We still have 3 project managers.
- And they each want their projects to start immediately and keep moving.

*How do they prioritize?* In the name of “**fairness**” they agree to share resources

...  
asking the staff to “multi-task”.

# 3. Real World Bad – Multi-tasking

Resources: x1 x1 x1



How is this going to work? **Notice the cash flow:**

We have no FLOWMASTER so, In order to keep all PMs and their customers happy, Blue will work on P1 for a bit, then P2 for a bit, then P3 for a bit, then P1 for a bit, then ... That's fair – right?

Notice how all three projects are making progress, albeit slowly? They are multi-tasking.

£ £ £ £ £ £ £ £ £ £10K/week

£ £ £ £ £ £ £ £ £ £8K/week

£ £ £ £ £ £ £ £ £ £5K/week

# Compare Project 1

## Multitasking

Let's look at Project 1, which has a *cost of delay* of £10,000 per week.

P1



48 weeks

## No Multitasking

P1



20 weeks

- Notice that P1 finished (an incredible) 28 weeks sooner.
- Cash starts flowing 28 weeks sooner.
- At £10K per week the cost of multi-tasking – the lost profit - was £280,000

# Compare Project 2

## Multitasking

Let's look at Project 2, which has a *cost of delay* of £8,000 per week.

P2  50 weeks

## No Multitasking

P2  28 weeks

- P2 started later ... but finished 22 weeks sooner.
- Cash starts flowing 22 weeks sooner.
- At £8K per week the cost of multi-tasking – the lost profit - was £176,000



# Compare Project 3

## Multitasking

Let's look at Project 3, which has a *cost of delay* of £5,000 per week.

P3



52 weeks

## No Multitasking

P3



36 weeks

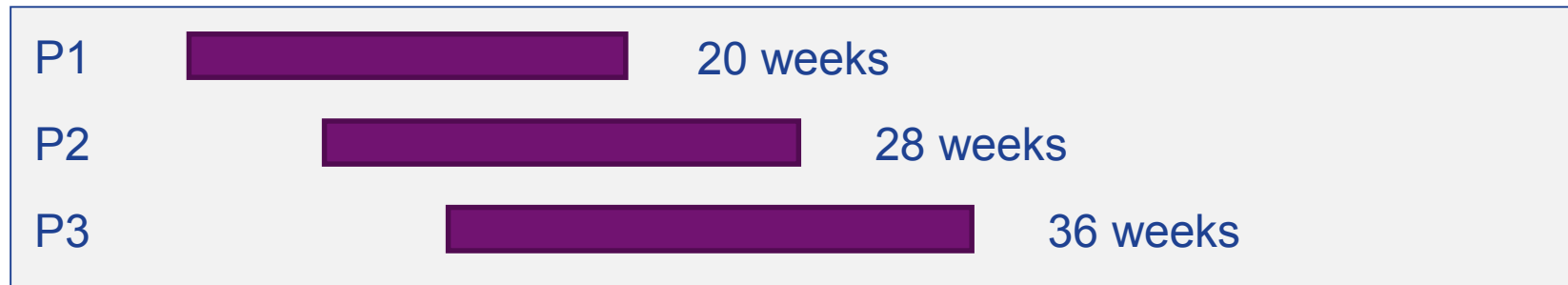
- P3 started much, much later ... but still finished 16 weeks sooner. [Go back and check ... I just did.]
- At £5K per week that's £80,000 lost forever due to multi-tasking.

# Compare Project end Dates

## Multitasking



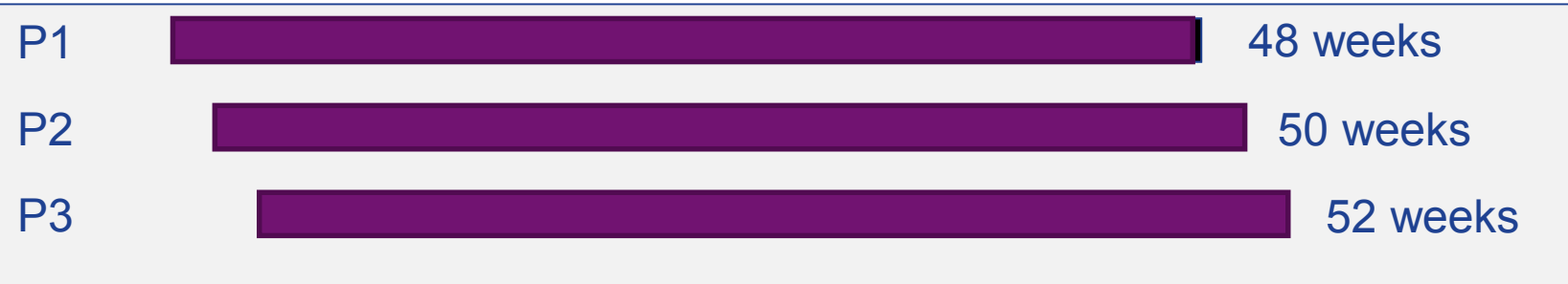
## No Multitasking



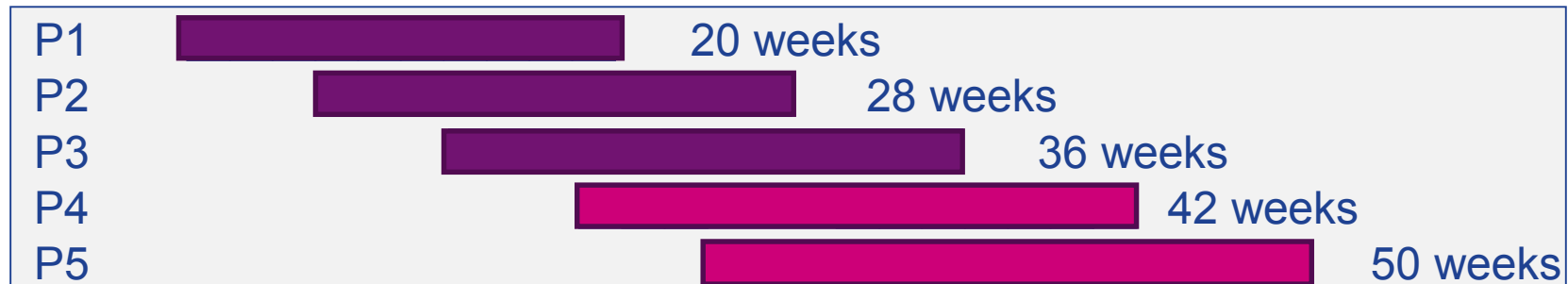
**Notice All 3 projects finish much sooner.  
Yes, all of them.**

# Compare Throughput

## Multitasking



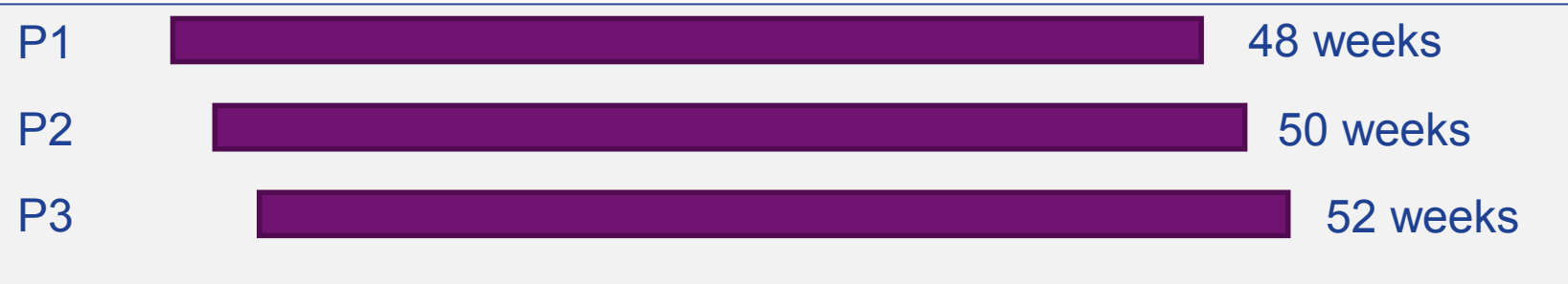
## No Multitasking



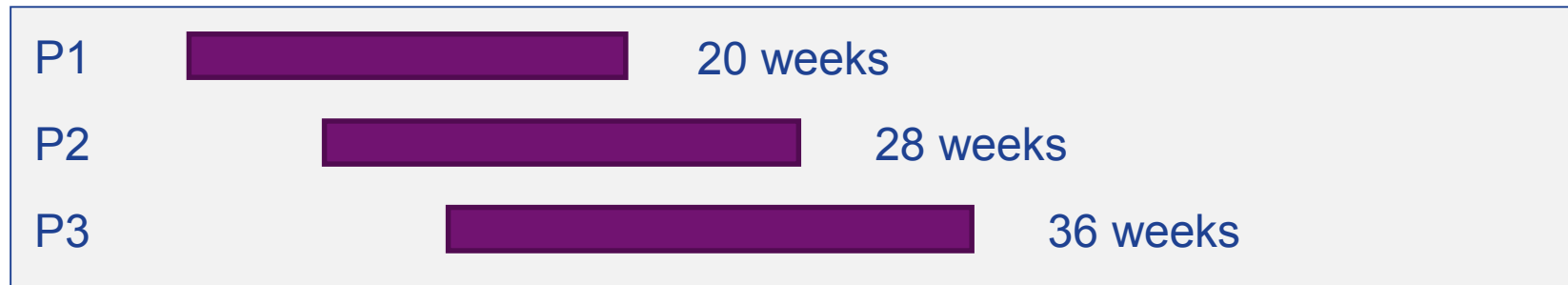
Without multitasking we can complete 2 more projects of similar size

# Compare Profits

## Multitasking



## No Multitasking



And, the multi-tasking scenario made £536,000 less profit than the non-multitasking scenario.

**£536,000 lost forever**

# Multi-tasking is evil.

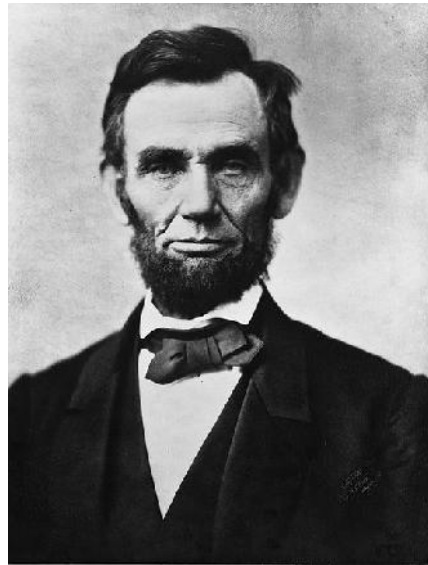
**The choice to multi-task  
is usually unconscious.**

**Or ignored because  
“It’s not my battle.”**

**Or lived-with because  
“It is my battle but I  
don’t want the fight”.**

What’s  
your Cost  
of Delay?

# Introducing: The inverted Pyramid



1.This evening at about 9:30 p.m. at Ford's Theatre, the President, while sitting in his private box with Mrs. Lincoln, Mrs. Harris and Major Rathburn, was shot by an assassin, who suddenly entered the box and approached behind the President.

2.The assassin then leaped upon the stage, brandishing a large dagger or knife, and made his escape in the rear of the theatre.

3.The pistol ball entered the back of the President's head and penetrated nearly through the head. The wound is mortal.

4.The President has been insensible ever since it was inflicted, and is now dying.

5.About the same hour an assassin, whether the same or not, entered Mr. Seward's apartment and under pretense of having a prescription was shown to the Secretary's sick chamber. The assassin immediately rushed to the bed and inflicted two or three stabs on the chest and two on the face. It is hoped the wounds may not be mortal. My apprehension is that they will prove fatal.

6.The nurse alarmed Mr. Frederick Seward, who was in an adjoining room, and he hastened to the door of his father's room, when he met the assassin, who inflicted upon him one or more dangerous wounds. The recovery of Frederick Seward is doubtful.

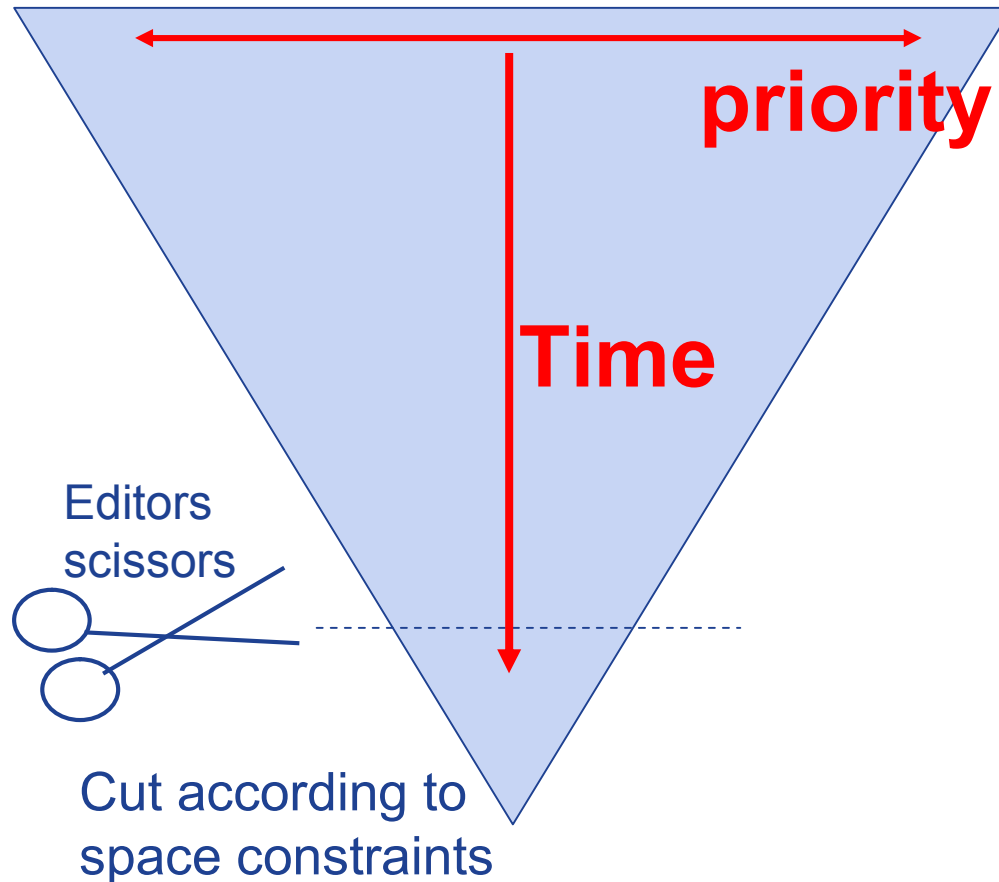
7.It is not probable that the President will live through the night.

8.General Grant and his wife were advertised to be at the theatre...

– New York Herald, April 15, 1865



# “Inverted Pyramid” (Invented 19<sup>th</sup> Century)



## NHS chaos exposed by new e-mails

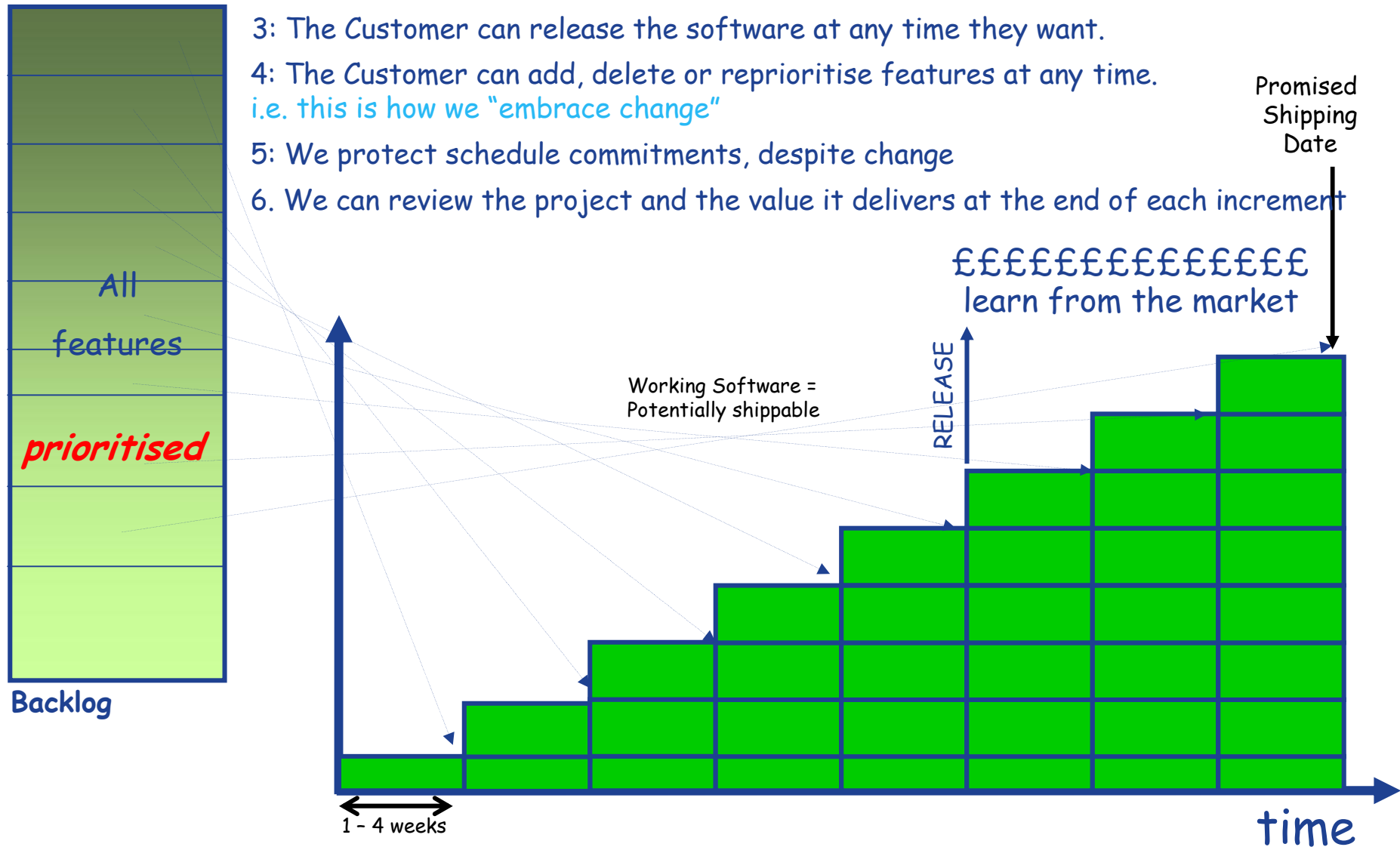
A COMPUTER project costing £6.2 billion that is central to Tony Blair's National Health Service reforms is in “grave” danger of being “derailed”, leaked Whitehall e-mails reveal.

1. The warning has been issued by Richard Granger, the £250,000-a-year civil servant in charge of what has been billed as the world's biggest civil information technology project.
2. The scheme is central to the government's plans to give patients wider choice by allowing GPs to book hospital appointments online with consultants throughout the country.
3. The problems have already caused a year-long delay in the booking system and now threaten to add millions to the cost of the project.
4. To date the system has made only about 20,000 appointments for patients. It was supposed to have made 250,000 by December 2004.
5. When it is fully operational the system is meant to be capable of making up to 9.5m first hospital appointments a year.
6. In the e-mail exchanges in September, Granger blames a senior civil servant in the Department of Health for the fiasco, criticising her **repeated last-minute changes** and failure to heed his advice.
- 7....

Jonathon Carr-Brown, *The Sunday Times*, November 13, 2005  
<http://www.timesonline.co.uk/article/0,,2087-1869851,00.html>

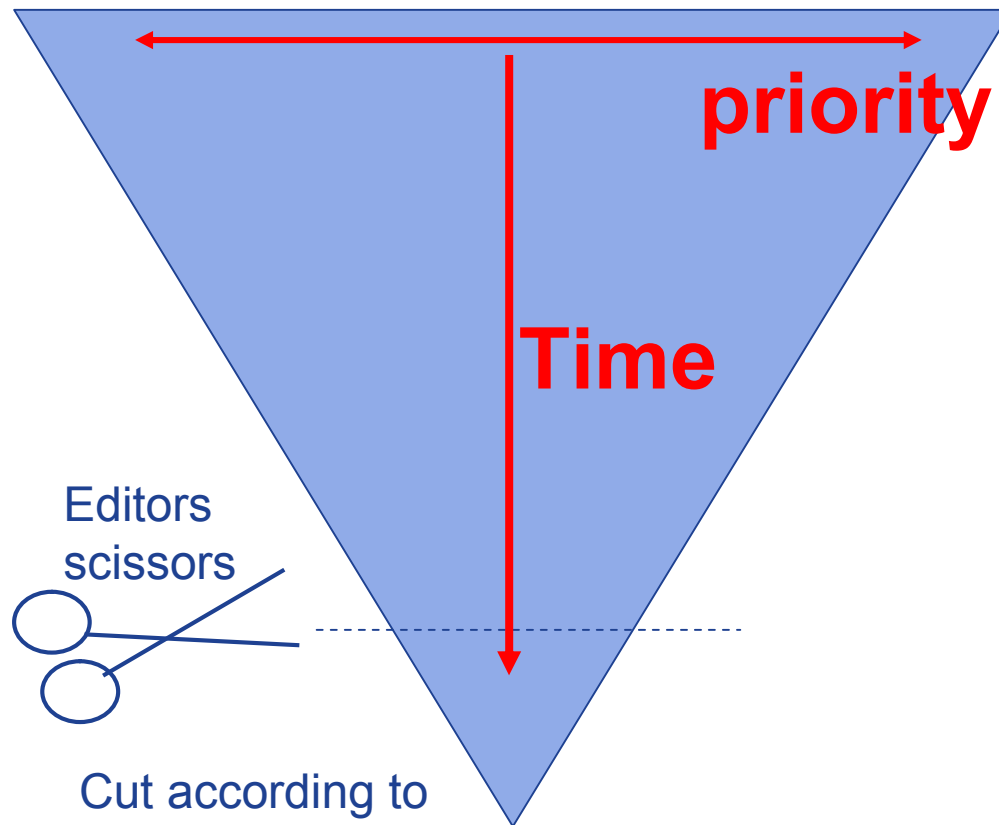
# Six principles of Agile Development

- 1: Customer lists known requirements (to a high level), then prioritises them.
- 2: Deliver chunks of high-value, well engineered, Working software often
- 3: The Customer can release the software at any time they want.
- 4: The Customer can add, delete or reprioritise features at any time.  
i.e. this is how we "embrace change"
- 5: We protect schedule commitments, despite change
- 6: We can review the project and the value it delivers at the end of each increment



# “Inverted Pyramid” (Invented 19<sup>th</sup> Century)

**The Lede = 80% of the value & 80% of effort**



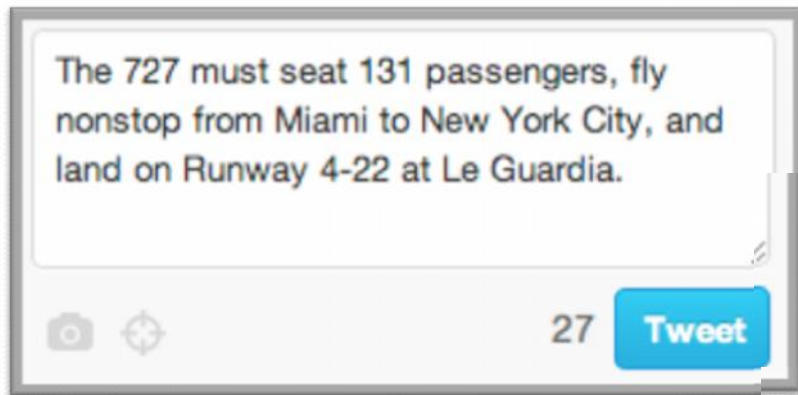
## NHS chaos exposed by new e-mails

**A COMPUTER project costing £6.2 billion that is central to Tony Blair's National Health Service reforms is in “grave” danger of being “derailed”, leaked Whitehall e-mails reveal.**

1. The warning has been issued by Richard Granger, the £250,000-a-year civil servant in charge of what has been billed as the world's biggest civil information technology project.
2. The scheme is central to the government's plans to give patients wider choice by allowing GPs to book hospital appointments online with consultants throughout the country.
3. The problems have already caused a year-long delay in the booking system and now threaten to add millions to the cost of the project.
4. To date the system has made only about 20,000 appointments for patients. It was supposed to have made 250,000 by December 2004.
5. When it is fully operational the system is meant to be capable of making up to 9.5m first hospital appointments a year.
6. In the e-mail exchanges in September, Granger blames a senior civil servant in the Department of Health for the fiasco, criticising her **repeated last-minute changes** and failure to heed his advice.
- 7....

# How do we create a project's Lede?

**1** Twomise – 140 character “story”-description of project.



**2** Top 10 – requirements list. (Requirements, not features).

1 . I want to drill a hole  
(to hang a picture)

[not I want a green drill  
with ...]

2. Costing less than ...

**3** Do you know your project's **Cost-of-Delay**?

- If this chip ships 2 months late we miss [Big Phone Maker's] development cycle and we lose £30M

- Each month's delay costs us £8,000 in extra support costs.

**4** Read: **Made to Stick** by Chip and Dan Heath.

**5** Write, read & challenge the business case.

# Snowball effect.



Remember these 3 projects?

Before: AAAABBBBCCCC

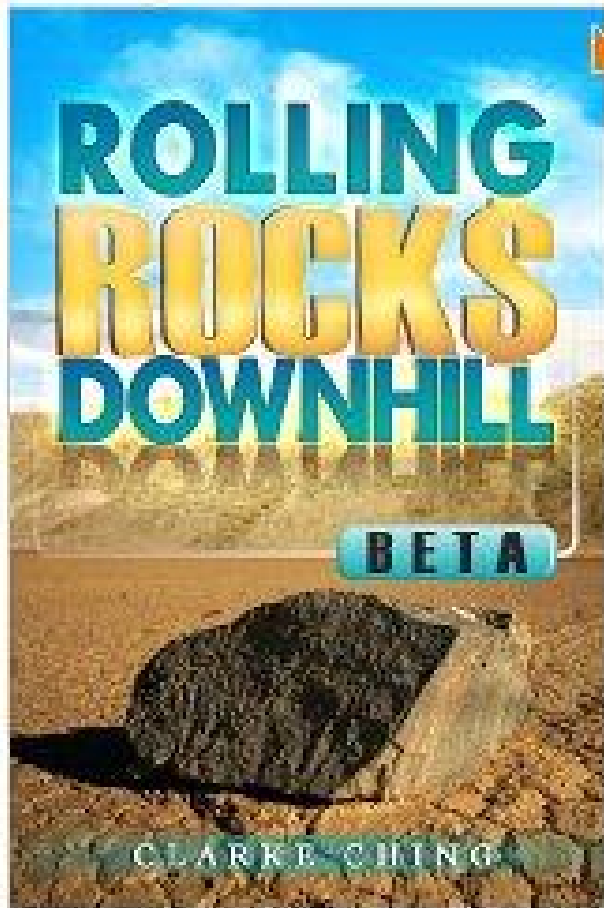
After: AAABBBCCC

If each project makes £100,000 a month *once delivered* then how much more does project A make?

Project B? Project C?

The projects not only finish sooner,  
they start sooner too.

Click to **LOOK INSIDE!**



kindle edition

Click to **LOOK INSIDE!**

