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Productive Forecasting

About the Speaker

Mike Younger – Jacobs, near Reading

I have been in the Oil and Gas business now for 35 years, since beginning an apprenticeship as a very young boy.

I have spent most of these years on the contracting sides with companies such as, AMEC, Bechtel , CJB, Fluor, Foster Wheeler, to name a few.

I am a chartered Engineer, with a degree in Mechanical Engineering I did over 8 years finishing at South Bank Poly

I am a proponent of lessons learnt

I am now on my third marriage to prove the point and have 2 teenage kids, I live in Bagshot Surrey now after moving west a few years back.

Agenda

- **Introduction to Productive Forecasting**
- Don’t look in the past too long
- Don’t just follow the plan blindly
- Sharing the forecast

- **Earned Value**
- What is earned value, what does it tell us?
- Earned value dilemmas
- What does the Productivity Factor tell us
- How to use PF to forecast
- Can we get the PF to be 1 throughout the Project?
- PF Summary

- **Quantity Forecasting**
- Quantity Forecasting introduction
- What Quantities can we realistically forecast?
- What do we mean by Quantity?
- Purchasing allowances
- When should we do forecast Quantities?
- How do we sample?

- **Summary**

- **Questions**

Introduction to Productive Forecasting

Those who cannot remember the past are condemned to repeat it – George Santayana

Past Performance is No Guarantee of Future Results – every get rich scheme advert you can name

If you can read the small print

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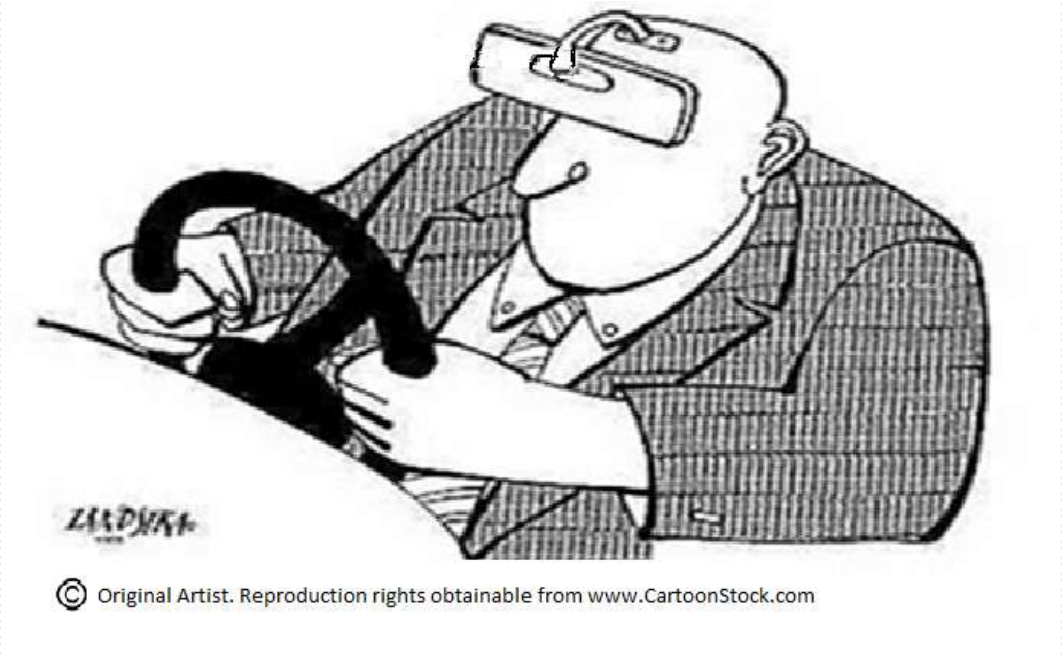
Don’t look at the past too long

- The past is interesting
- But would you drive like this!



- But many chose to control projects this way!

Don’t just follow the plan blindly

- With modern computers and software it is easy just to stick to the plan
- To continue the theme,

•Do you do what Tom says, no matter what?

Don’t just follow the plan blindly

Phenomenally foolish: This driver blindly followed his satnav even when it led him down this tiny alley

Read more: http://www.dailymail.co.uk/news/article-2051302/Lorry-driver-wedges-13-ton-HGV-narrow-alley-blindly-following-satnav.html#ixzz3EEvATsWC
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Forecasting needs to be shared

- You need to share.
- What would you do next?

Forecasting needs to be shared

- You could

Forecasting needs to be shared

- This might be better

Look out Iceberg Ahead!!!

Earned Value

EV

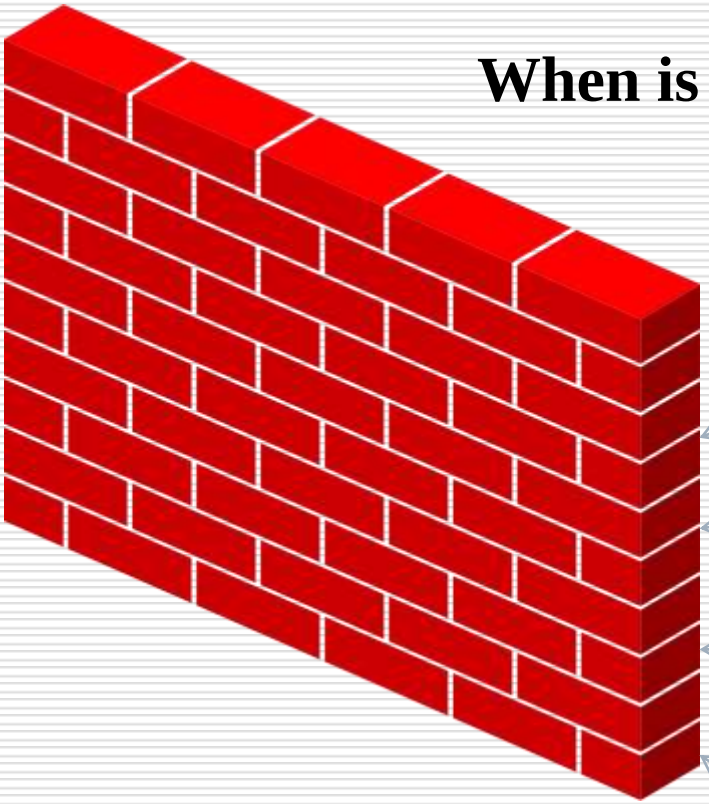
What is earned value and what does it tell us?

- It is what we have achieved so far of the budget

- Therefore if we divide the earned value by the budget we get percentage complete.
- If we divide the earned value by the actual spend we can then find out our productivity, so greater than 1 is good (CPI)
- Finally if we divide the earned value by the planned earned value we can tell where we are schedule wise SPI)

- A Powerful analysis tool indeed

Earned value Dilemmas



When is a new 4m wall half complete?

Half the time

Half the bricks

Half the material cost

Half the total cost

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Earned value dilemmas

- EV should represent what you have earned vs Schedule

- So collect it and analyse it and combine it correctly

What does the Productivity Factor tell us

- Simply PF = earn over burn……..in most cases
- > 1 is therefore good.
- Think of it as efficiency so 1 = 100% efficient, 0.85 means 85% effective or more importantly, 15% of the effort is being wasted
- So if I am performing above 1, does this mean I can then start to forecast a saving?
- No!

What does the Productivity Factor tell us

- Being above 1 is not always efficient, it could just be;
  - You have measured wrongly
  - You have been over generous with your subjective measures
  - The actuals as yet do not represent the true accrual
  - You may be efficient but you may well be very late because of this

- So does being less than 1 mean you should forecast an overrun in budget?

- No!

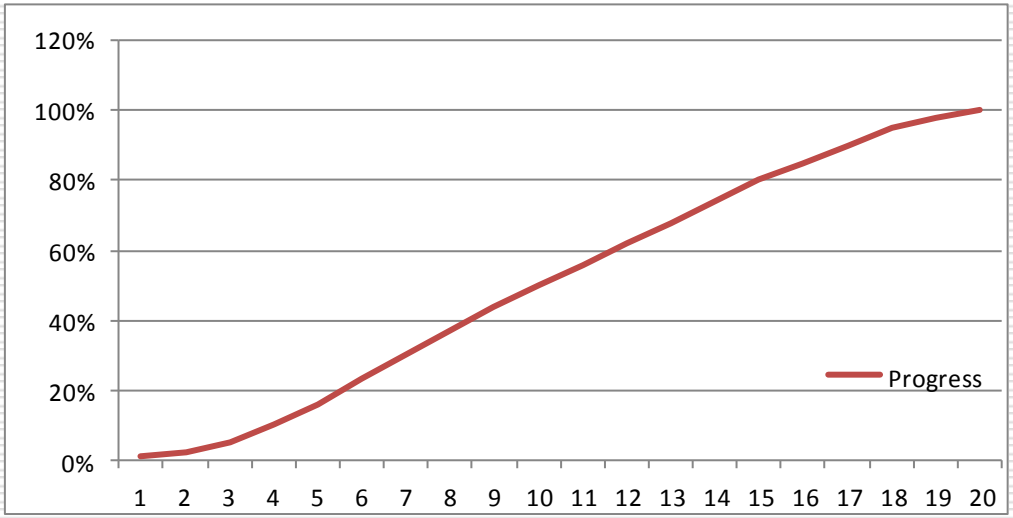
What does the Productivity Factor tell us

- Being below 1 is not always inefficient, it could be
  - You have measured wrongly
  - You have been over cautious with your subjective measures
  - The actuals as yet do not represent the true accrual
  - You may be inefficient now but you could be way ahead of schedule

- PF is just one dimension.

How to use PF to forecast

- PF is a moment in time and mostly based on subjective values so;
  - Plot the rate of EV that is expected each month as a cumulative S-curve using P6, Microsoft Project planner or that excellent PC system E X C E L.
- A typical example is shown



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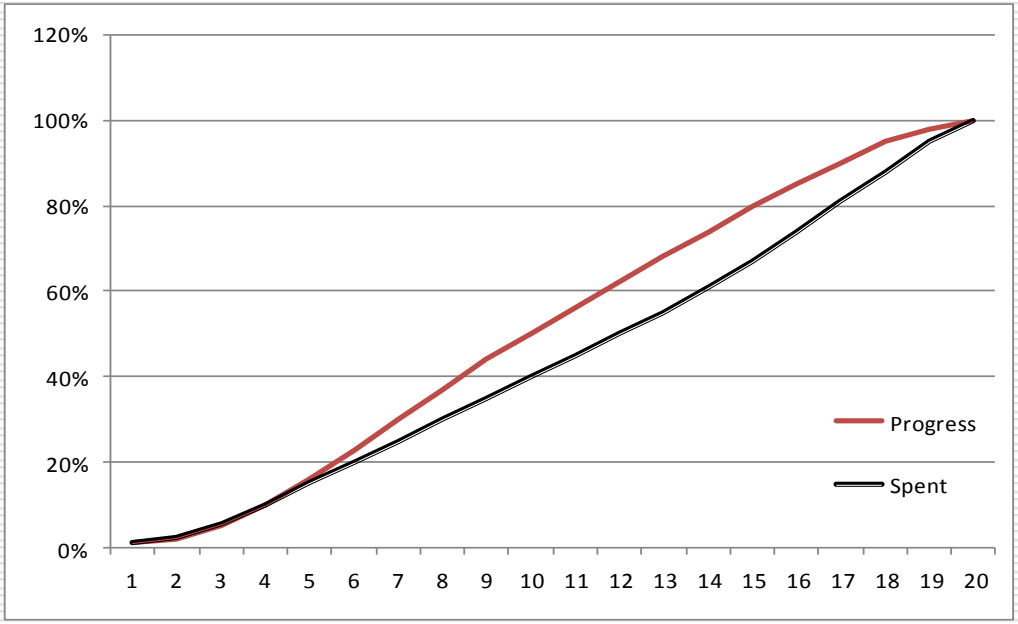
How to use PF to forecast

- Add to this graph another curve showing cumulative "cash flow" expected as a percentage of budget, be it hours, quantities or cash.



- As you can see they are not the same

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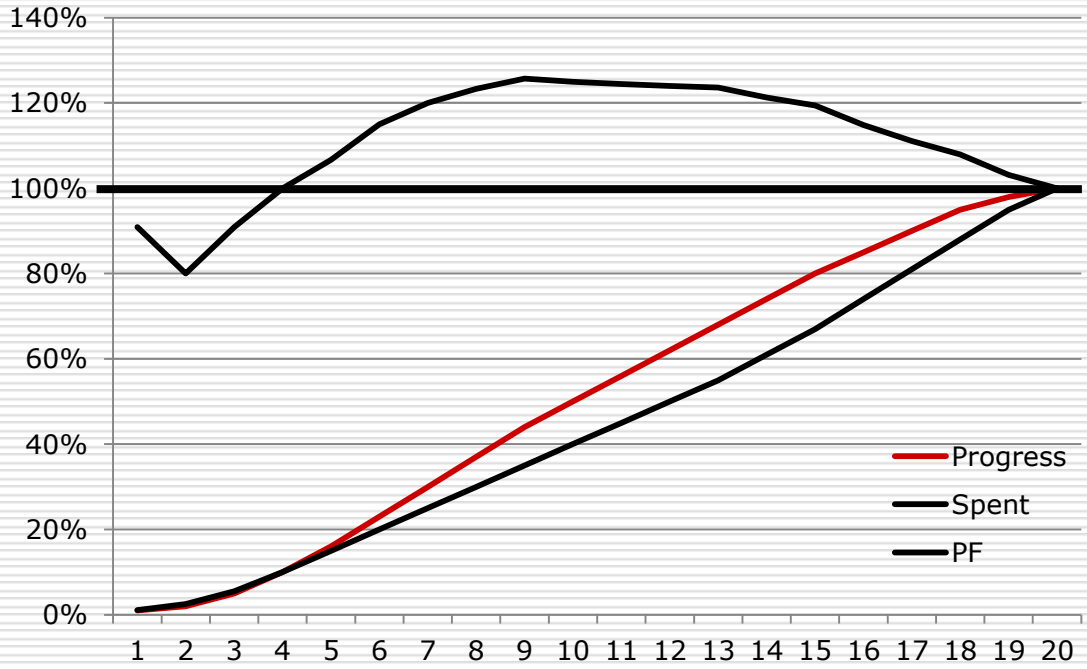
How to use PF to forecast

- So why would we expect the PF to be 1 at the end of every month?
- So forecast the PF too



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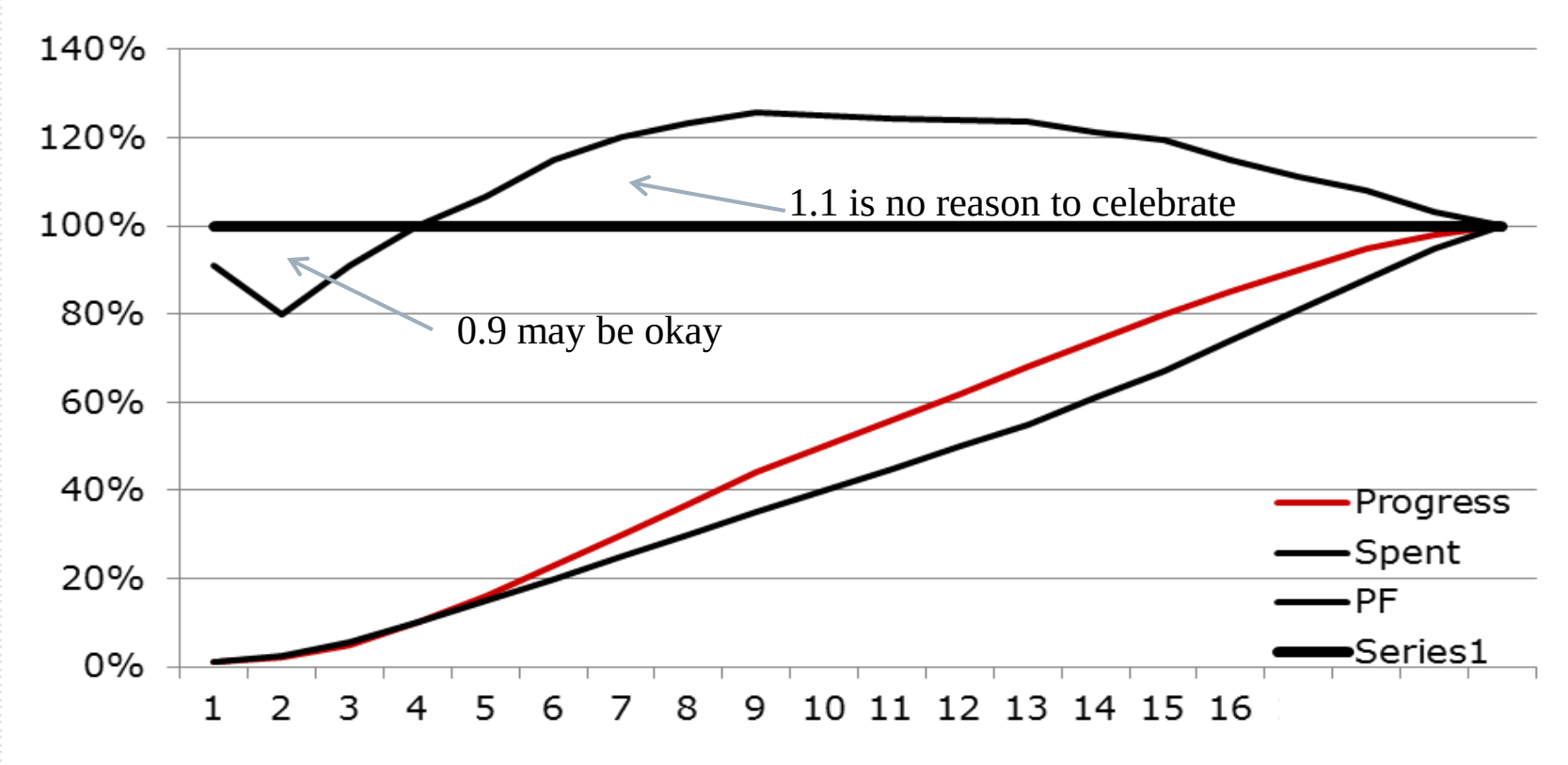
How to use PF to forecast

- What does this tell us?



How to use PF to forecast

- If the PF at month nine is 1.1 versus 1.21 plan then we could then assume this loss would never be made up so at the end we will be the same 0.11 behind hence our final PF will be 0.89 or a 12.4% overrun on budget

Can we get the PF to be 1 throughout the Project?

- The short answer is yes, but why is progress nearly always ahead of cash flow?
- Human nature,
- Progress payments
- Morale
- The schedule could be wrongly loaded
- We underestimate the finish needs

- All obvious, so why do we forget this?

Can we get the PF to be 1 throughout the Project?

- So how can we fix it?
- Make sure Earned Value is the Value we have Earned
- How can we do this?
  - Where we can, remove subjective progress measurement by;
    - Using Quantity Surveyors to measure progress
    - Use CAD outputs to measure maturity of design
    - Milestones
    - Review of these
    - Adjust if necessary

Can we get the PF to be 1 throughout the Project?

- Know what actual, or burn means in the plan?
  - Commitment
  - Accrual
  - Invoices received
  - Invoices paid
  - Payment made
  - Etc.
- So link these to the same measure as you use for progress in the Schedule.

Can we get the PF to be 1 throughout the Project?

- If not why not use relative PF?

- Actual PF/Planned PF

PF Summary

- To summarise we need to;
  - Analyse PF each month and know the plan for this.
  - Check earn and burn are correct
  - Draw a PF curve
  - Update and forecast this
  - Take remedial actions to get back to a final 1 or better, if you can
  - The earlier you spot a problem the easier it is to deal with, so start looking on the horizon for ice bergs
  - There is never a do nothing option if you productively forecast

Quantity Forecasting

Quantity Forecasting introduction

- This is an area where you can lose a fortune and a create one too
- The only problem with creating a fortune is it will not be yours it will be the local scrap dealers

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Quantity Forecasting introduction

- There is always a balance to be met between running out of materials versus running out of work
- Can we avoid this?
- Forecasting will help

What Quantities can we realistically forecast?

- Tagged Equipment.
- Consumables

- But we are not talking about these today
- This section deals with the permanent so called bulk materials

What do we mean by Quantity?

- Well there are;
  - What you can see now
  - The final design quantity
  - Construction quantities
  - What you will need to buy
- Most of the time if you wait until you know what to buy it is too late to deliver
- So how do we know how much to buy?

Purchasing allowances

- Firstly we need to know where the current design is
  - MTO's
  - Use CAD
  - Make sure components are correctly coded for identification
- Next we need to add on for design yet to take place
  - This can be by using norms
  - By guessing
  - – sorry Estimating
  - Or by actually talking to the designers, would recommend this one, surprising how many don't

Purchasing allowances

- Cut and Waste
- Don’t exaggerate this
- Keep records of past jobs and adjust this factor in future
- This does not take place as often as it should as people are;
  - Not willing to admit this
  - Desperate to get off the job and/or required elsewhere
  - It is extra costs at the end

Purchasing allowances

- If we do this then we will know what allowance are applicable for each project and perhaps location

- Not to do this is a false economy

When should we do forecast Quantities?

- All the time
- But in reality it should be when something changes or we are asked to change something
- Trying to do this across the whole job is very hard, so break it down e.g. , into areas, systems or funding.

How do we sample?

- Sample or trend these.
- Once this sample result is calculated you can see what that might mean
- It is a smoke detector only so check!
- Never assume an overrun or underrun now, will be offset later, this rarely happens

How do we sample?

- Okay so the cable quantity needs to be increased, this is the start but not the end
- More cable must mean;
  - More cable tray
  - More cable glands
  - Potentially more light bulbs and switches
  - More electrical labour hours

- Okay is that it, do we just change the Electrical Forecast?

- No!!

How do we sample?

- You need to consider is this growth just related to cable
- More cable tray could mean more foundations
  - More concrete
    - More rebar
      - More land
        - More time
          - Etc.
- Sample today, save tomorrow
- Buy back is not the answer most times

Summary

- Forecast like you drive a car using the same percentages
  - 10% looking back where have you been
  - 15% where am I now? Should I be turning, stopping or speeding up for an emergency?
  - 75% looking forward, making assessments and judgements that mean you are;
    - Prepared for anything
    - Have enough fuel for you and the car
    - Know when you are getting there and if you need to slow down or speed up
  - **If you are not forecasting are you really needed?!**

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Questions

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