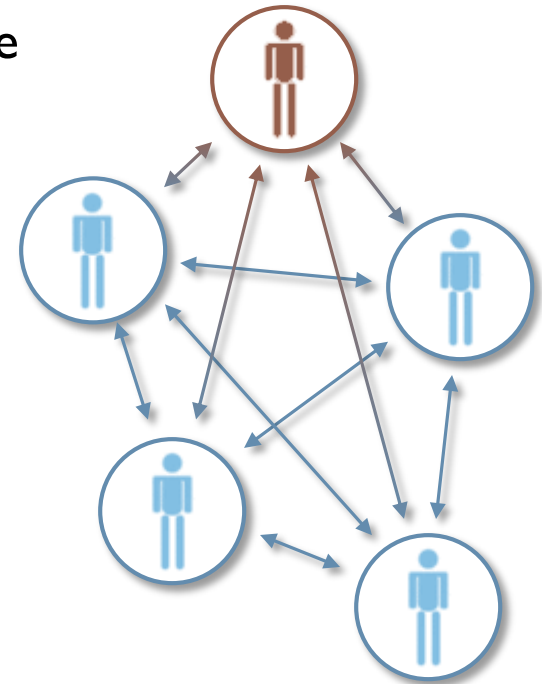


Animating the Army With the Same Spirit

- ▶ Sun Tzu recognizes the importance of human motivation, morale and a shared vision to the success of the military
- ▶ The cost estimating team lead must also encourage and reward their team for performance as well provide a unifying vision for their team
- ▶ This can be done by:
 - ▶ Award nominations
 - ▶ Verbal recognition and acknowledgement
 - ▶ Establishing clear priorities
 - ▶ Open office policy
 - ▶ Flexibility and trust
 - ▶ Many more...
- ▶ Beyond the cost team it is important to foster:
 - ▶ Reliable point of contacts lists
 - ▶ Program office and contractor relations



Be Prepared; Take the Enemy Unprepared

To secure ourselves against defeat lies in our hands, but the opportunity of defeating the enemy is provided by the enemy himself.

Sun Tzu, *The Art of War* (4:2)

- ▶ **Victory, and credibility, comes to those who plan and prepare**
- ▶ **Common cost estimate preparations:**
 - ▶ Know who the estimate is being briefed to and their area of greatest interest
 - ▶ Tailor the estimate documentation to align with reviewer's preconceptions
 - ▶ Emphasize the estimate's strengths and acknowledge the estimate's weaknesses
 - ▶ Thoroughly review documentation for typos and errors

No Interference from the Sovereign

In war, the general receives his commands from the sovereign.

Sun Tzu, *The Art of War* (7:1)

- ▶ **The ruler who interferes in war hinders the general and makes it more difficult to achieve victory**
 - ▶ Hobbling the army by ordering the army to advance or retreat at the wrong time
 - ▶ Creating restlessness by governing the army like any other government entity
 - ▶ Shaking confidence in the ruler by using the same tactics and strategy regardless of the situation
- ▶ **A PM can interfere with the CE in many ways**
 - ▶ Setting unrealistic deadlines
 - ▶ Assigning tasks that are more suited to financial analysts
 - ▶ Mandating cost estimating methodologies

The Four Methods of Engaging in War

- ▶ Sun Tzu identified and ranked the four basic strategies that can be engaged in war in order of “superiority”
- ▶ The ranking is based on the practical metric of payout to investment
- ▶ It is tempting to attempt to draw a direct comparison between these four methods and the four basic cost estimating methodologies, but this is not possible
- ▶ Instead we will evaluate the four methodologies based on the payout to investment metric

1	<i>Attack the enemy's strategy</i>
2	<i>Isolate the enemy from allies</i>
3	<i>Attack the enemy's army</i>
4	<i>Besiege walled cities</i>

The Direct and the Indirect

- ▶ Sun Tzu explains that there are two broad methods of attack in combat: the **Direct** and the **Indirect**
- ▶ The two methods blend together and can be difficult to differentiate
- ▶ It is the indirect methods that secure victory
- ▶ In cost estimation there are two types of estimating:
Biased and Unbiased
 - ▶ Biased estimating uses people as sources
 - ▶ Unbiased estimating uses cost data as sources



Cost Estimating Methodologies

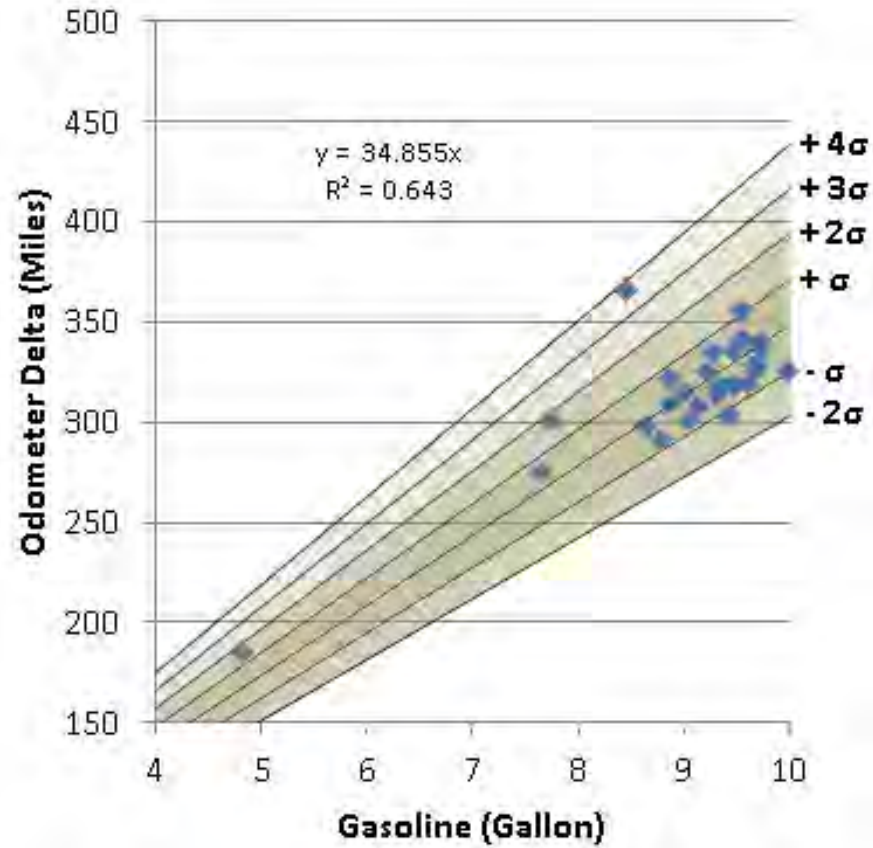
Analogy

- ▶ Trends towards **Biased** due to reliance upon expert opinion
- ▶ Analogies have a low investment/development time
- ▶ To establish credibility emphasize unbiased aspects
 - ▶ Similar technical characteristics
 - ▶ The same developer

Parametric

- ▶ Trends towards **Unbiased** due to reliance upon cost estimating relationships (CERs)
- ▶ Parametric have a high investment/development time
- ▶ Regularly updated and maintained databases can mitigate investment time
- ▶ Bias still appears in the form estimator judgement
 - ▶ Correlation / Causation
 - ▶ Outliers

Gas Mileage Example



Cost Estimating Methodologies

Engineering Build-Up

- ▶ Trends towards **Biased** due to extensive engineering expertise needed to examine a system at the component level
- ▶ Engineering build-ups have a high investment/development time
- ▶ Natural tendency of programs to gravitate to this methodology
 - ▶ PMs want to see cost estimate align with program elements
- ▶ Easy comparison to similar estimates when tasks are broken down to component level

Actuals

- ▶ Trends towards **Unbiased** due to use of cost histories
- ▶ Actuals have a low investment / development time if the program is late enough in the acquisition cycle; impossible before then
- ▶ Examples of Bias in Actuals
 - ▶ Use of EVM data
 - ▶ Production breaks with Learning Curve
 - ▶ Recurring and Nonrecurring costs

The Five Types of Spies

- ▶ The key to Sun Tzu's strategy is revealed in the final chapter of *The Art of War: The Use of Spies*

Knowledge of the enemy's disposition can only be obtained from other men

Sun Tzu, *The Art of War* (13:6)

1 *Local Spies*

- ▶ The people living on the land; non-officials

2 *Inward Spies*

- ▶ Officials in the enemy's government or military

3 *Converted Spies*

- ▶ Enemy spies that you use for your own purposes

4 *Doomed Spies*

- ▶ A spy intended to be captured to give false info

5 *Surviving Spies*

- ▶ A spy who returns from enemy territory

Gathering Cost Data from People

- ▶ All cost data you gather from people (spies) is biased, but biased data is not necessarily bad data
- ▶ A credible cost estimate endeavors to verify and justify bias in the cost documentation

Spies cannot be usefully employed without a certain intuitive sagacity

Sun Tzu, *The Art of War* (13:15)

The Local Spy

- ▶ A person formally associated with the program that is not in a leadership position
 - ▶ Contractor Engineer
 - ▶ Execution Analyst
 - ▶ Factory Line Worker
- ▶ Good source of information on specific tasks and elements of the overall program
- ▶ Good for helping construct Engineering Build-Up or Actuals cost estimates
- ▶ Challenging to use for larger programs due to the number that would need to be maintained

The Inward Spy

- ▶ A person in a position of authority that is indirectly associated with the program
 - ▶ Finance Officials
 - ▶ DCMA Representative
 - ▶ Competing Contractor
- ▶ Good source of information on broad assumptions and ground rules that can impact a program
- ▶ Challenging to use for many reasons
 - ▶ Often outside the social and professional circles inhabited by cost estimators
 - ▶ The number of people indirectly tied to a program is orders of magnitude larger than those directly tied to the program
 - ▶ The cost estimator often cannot make use of this data as ground rules and assumptions are controlled by the PM

The Converted Spy

- ▶ A person assigned to support the program from an outside organization that is directly tied to the program
 - ▶ Contractor Technical Point of Contact
 - ▶ Vendor Representative
- ▶ Intended to represent the interests of their organization, but can serve as a valuable data source for the program
- ▶ Enables the acquisition of Local and Inward spies
- ▶ Good source of data to support all cost estimating methodologies
- ▶ Data provided by the Converted Spy is Bias
 - ▶ Conventionally Biased
 - ▶ Sourced in a person
- ▶ Easy to acquire and maintain
 - ▶ The work is done for you!

The Doomed Spy

- ▶ Not a person in cost estimating (*that would be illegal!*)
- ▶ The Doomed spy is similar to the process of socializing the data and assumptions with the stakeholders with the intent that they correct erroneous elements
 - ▶ Increases estimate credibility in the eyes of the stakeholders by increasing their buy in
- ▶ Makes use of Cunningham's Law

The best way to get the right answer on the internet is not to ask a question, it's to post the wrong answer.

Howard Cunningham

The Surviving Spy

- ▶ Often not a person (conventional spying is illegal)
- ▶ Official reporting
 - ▶ Contractor Data Reports
 - ▶ Proposals
 - ▶ RFIs
- ▶ The result of the program requesting certain information and receiving that information
- ▶ Data can be flawed and bias, as always care must be taken to verify and validate the reports

Conclusion

- ▶ Strategy is important in cost estimating
- ▶ Sun Tzu's strategic insights can be applied to cost estimating
 - ▶ The Five Factors
 - ▶ The Five Essentials
 - ▶ The Four Methods
 - ▶ The Five Types of Spies

Bad strategy, brilliantly executed, is still bad strategy



Questions?