CMMI AS A SAFEGAURD AGAINST SOFTWARE ENTROPY: MANAGER'S PERSPECTIVE
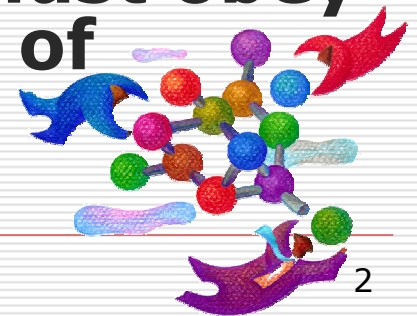
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16 Nov, 2005

SOFTWARE ENGINEERING

☐ **Software Engineering is part of Systems Engineering**

☐ **Systems Engineering is the disciplined application of tools and principles to achieve a complex goal**

☐ **Systems Engineering must obey the Fundamental Laws of Physics**

THE LAWS OF PHYSICS

- ☐ **But what are the fundamental laws of physics?**
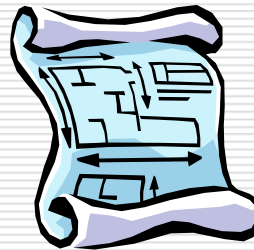
- ☐ **F=MA?**

- ☐ **Earlier seminal work at SSTC 2005 said "Yes" – Newton's Laws of Motion govern Software Engineering**

THE LAWS OF METAPHYSICS

☐ "I think therefore I code"

☐ No, No!!

☐ Even EEs understand Inertia but, could there be some law even more fundamental than that?

THE LAWS OF NATURAL PHILOSOPHY

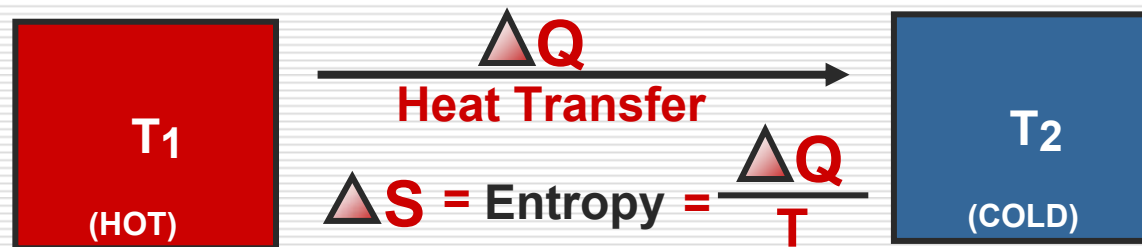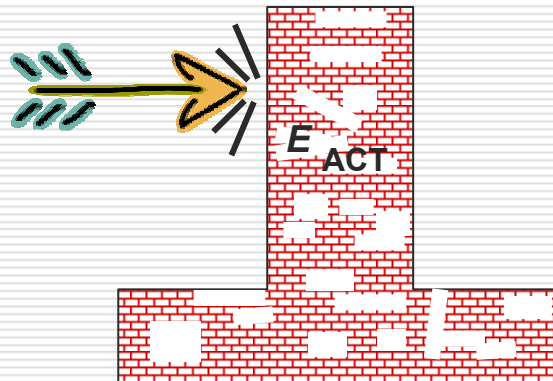## -- YES --

THERMO

The unexplainable

1ST LAW – CONSERVATION OF ENERGY

$$\triangle Q$$
Heat Transfer

T$_1$
(HOT)

$$\triangle S = \text{Entropy} = \frac{\triangle Q}{T}$$

T$_2$
(COLD)

"If the state of a system is changed by applying work or heat or both, then the change in the energy of the system must equal the energy applied"
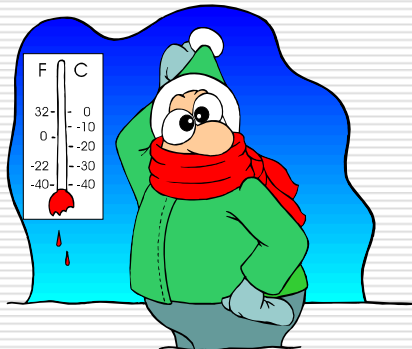
2nd LAW – TENDENCY TOWARD EQUILIBRIUM

"It is impossible to move heat, by cyclical process from something at lower temperature to something at higher temperature unless work is added to the system"

E_{ACT}

3rd LAW – ABSOLUTE ZERO

"If the entropy of each element at absolute zero can be taken as zero, then all elements above absolute zero must have a finite, positive entropy; however, because entropy cannot be reduced to zero by finite means (as per the Second Law), no system can reach absolute zero"

Since we are
Software Engineers
- Not Physicists –

Let's put them into Software
Engineering - Speak

☐ **1ˢᵗ Law: You Can't Win – Just Break Even**

☐ **2ⁿᵈ Law: You Can Only Break Even at Absolute Zero**

☐ **3ʳᵈ Law: You Can't Reach Absolute Zero**

THE SOFTWARE LAWS OF THERMODYNAMICS

- **Optimizing software quality, cost, schedule require proper processes, planning, and people**

- **Proper processes, planning and people requires time to do it right**

- **There is NEVER time to do it right**

"RASSA'S LAW"

☐ "No one can resist the temptation to edit another's work or start coding on the first day of a program"