TO BE OR NOT TO BE HACKED?

by William Shakespeare,
alias Moises J. Goldman and John Jonelis

William "Moises" Shakespeare

Hamlet—To be or not to be hacked? That is the question. Whether 'tis nobler to suffer the slings and arrows of outrageous fortune, or to take arms against a sea of phishes, gouged by creatures who boast no scruple, nor affect any purpose higher than foul destruction—and by opposing, end them?

[Editor's translation—Hackers are a bummer. This is war.]

Or may say 'tis wiser to remain in dungeons rank and old—to sleep, perchance to dream—ay, there's the rub. For in that sleep, what dreams may come? The internet makes cowards of us all.

[Editor's translation—Should I upgrade the robustness of my internal infrastructure and firewalls?]

Horatio—But soft, me lord, to think upon the many turns a kindom make.

Betwixt two means shall we choose to take.

[Editor's translation—There are two good options.]

Hamlet—Ay, the dilemma. To guard against an angry pack of dogs that tear and rent and hack away till strength and blood be spent—or flee? How wouldst thou fight, Horatio? I would not hear your enemy say you could do it. Nor shall you do my ear that violence.

[Translation—Don't feed me a pack of lies. If we encrypt all sensitive data and cyber-secure our network we still can't achieve fail-safe.]

Horatio—Hear me lord; I make my case:

Should bits and bytes habitate high Cloud—

A kingdom's gold to free?

No arms, no knights, no castle wall
   to tug a purse's string so proud!

'Stead exult in markets, foul of hogs and
   sheep and goat?

Entice the sorcerer to play in darker art, in unknown moat?

To raise a legion—conquer lands anew beyond the sea?

And so extend a kingdom's reach?

 *[**Option #1**: The Cloud is cheap. Save your money for marketing, R&D, and expansion.]*

Hamlet —Methinks this boy hath soundly grounded thought. He makes **PaaS**-ing **SaaS** at learning dearly bought. It takes no brain to buy his train of thought.

[Seems like a no brainer. The Cloud. Platform as a Service—Software as a Service. Let's do it!]

Horatio —But soft, me lord, I fear foul play!

 This Cloud by wild winds be cast astray.

 It boasts no force to hole such gauze with tumult and in fray,

 And by doing so, steal treasury of intellect away.

 'Tis best, to build yon castle walls of stouter stuff, some say.

 Keep bytes and treasure close and spend on fodder and on hay.

 *[**Option #2**: The Cloud is way too vulnerable to attack.
  Update your in-house network.]*

Hamlet —Wouldst thou squeeze gold from a lark? Something is rotten in the state of Denmark. But harken thee—where may best advantage be? What odds see ye?
[That equipment's really expensive! What's the probability of getting hacked either way?]

Horatio—Sorcerers be that wouldst draw

Straight crook from snarled oaken saw.

[Mathematicians use probability trees.]

Hamlet —O cursed spite that ever I was born to set it right!

[I hate math!]

Horatio —Of haste take not. Outcomes be but three.

Take heed of which I shew to thee.

[No big deal. There are only three probable outcomes.]

> **P1** – Enterprise goes to **external cloud center** and is **NOT HACKED**
>
> **P2** – Enterprise goes to **external cloud center** and **IS HACKED**
>
> **P3** – Enterprise **upgrades internal systems** and despite the robustness of the upgrades, **IS HACKED**

Hamlet—Hold, varlet! A fourth ye lacked—that one repent and not be hacked.
[Hamlet has noticed a missing variable: An enterprise upgrades internal systems and yet escapes hacking.]

Horatio—'Tis true M'lord, yet is it moot?

Foes be met; nought ground 'neath heel o' boot.

Complication wears poorly on thee.

There be no guarantee.

This outcome we call **1-P3**.......(1)

Hamlet—Ha! There are more things in heaven and earth, Horatio, Than are dreamt of in your philosophy.
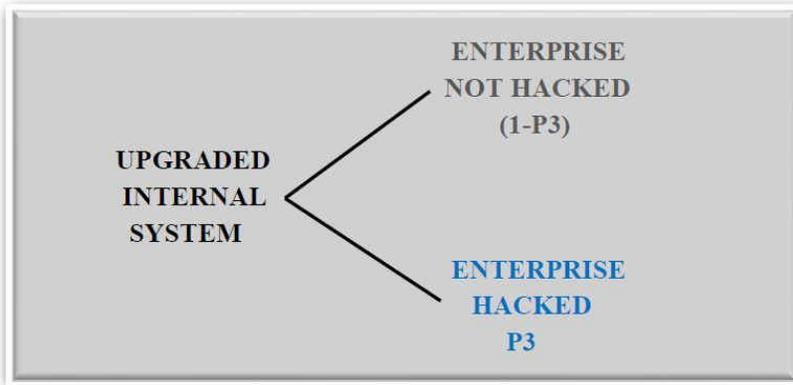*[Maybe I'm not as dumb as I look.]*

Horatio —'Tis sooth, my liege—I seek not to deceive.

      Perchance I draft a map—deeper knowledge ye may tap.

      Yon magic shall appease;

      Thy grace's ire set at ease.

      [I'll make it simple, so even you can see. Take a look at this probability tree.]

M'lord do you see?

If systems new and hacking lacking,
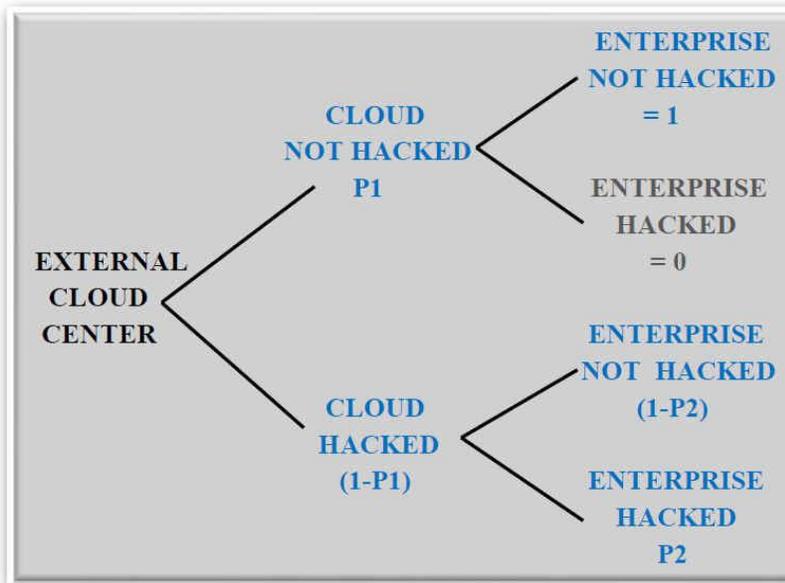   probability is simply **1-P3.**

(The probability of an internal network not getting hacked.)

Hamlet—What make I of this wonder? To ask a fool is to blunder.

Horatio—Magic formula ye seek, to make right your decision?
      Fortunately, Shakespeare knows it with precision.
      [Be cool. I got this.]

Look here, dear Ham, and spy
      yon enterprise,

Floating on the Cloud 'tis wise.

Not to hack or nick sharp blade.

We dig our likelihood with spade:

'Tis thus:
$$P1+(1-P1)(1-P2) = 1-P2(1-(1-P1)........(2)$$

[The probability of not getting hacked on the Cloud.]

Hamlet — *[Aside]* Madness in great ones must not unwatch'd go. A screw is loose. He rhymes like Dr. Seuss.

    [Horatio's gone bonkers.]

Horatio —But hark—magicians work

dark secrets in a day

That mortal man can plumb no other way.

I spell it in a cypher so you see

The final answer to this mystery.

[Here dummy, I'll spell it out for you.]
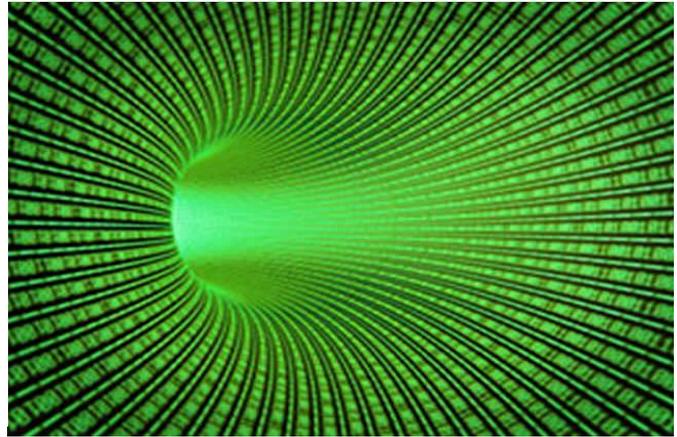
Hamlet—Indeed, this must I see.

Horatio—Floating on a Cloud,

Yon enterprise two chances escape plunder,

To hide from doom, not hacked asunder.

The Cloud foul Russian must attack rapaciously

Before cursed knife shall reach its mark with certainty.

[If your enterprise is on the Cloud, hacking is a two-stage process.
The Cloud may get hacked. But even then, your enterprise may escape damage.]

To ride the Cloud in skies of blue, equation (1) must be less than (2).

Hence: $1-P_3 < 1-P_2(1-P_1)$.......(3)

We boil down that poison thus, and there we gain the clue.

If fates would their due, we sing this song,

Our enterprise will float along.

And thus: $P_3 > P_2(1-P_1)$

[This is the absolute condition for an enterprise to go to the Cloud.]

Hamlet—Dost thou think me easier play'd on than a pipe? For 'tis sport to have the enginer hoist with his own petard, an't shall go hard.

Horatio— M'lord salves the ego with a threat.

      Is this the way all friends are met?

      But hear me, sire, 'tis plain to do.

      I will write it out for you.

      Be ye not a foe to the way the numbers go.

      Ye shall recall the probability of hacking free be **1-P3**.

      If wise man, on gauzy Cloud his merit bent,

      To the tune of 80%,

      The numbers shew: *$1-P2(0.2)$*

      *[Here ya go, Mr. Bigshot CIO—if the probability of not getting hacked on the Cloud—**P1**—is 80%, then **$1-P2(1-0.8)$** hence **$1-P2(0.2)$**]*

Hamlet—Still it be Greek to me.

Horatio —Here, my lord, I will unravel

      The way that ye must travel,

      To the ending of thy quest.

      Be in knowledge, not in jest.

      [Gotcha!]

Hamlet—Get it over before I die.

Horatio —Here's an end so ye may rest

      Like bones inside a chest.

      If **$P3>(0.2)P2$** be true,

      To the Cloud get ye hence,

      Else makest equipment new

      And play yon cards close

        to thy vest.

[I'll do the math for you. This is how a CIO's decision gets proved true.
If P3>(0.2)P2, go to the cloud. Otherwise, upgrade internal equipment and software.]

Hamlet —*[Aside]* This be a fellow of infinite jest, of most excellent fancy. He rhymes obtuse like Mother Goose. Yet I shall the effect of this good lesson keep as watchman to my heart.

(Translation—Good! Let's get some pizza.)

EXAMPLE: Solve for $P3 \geq (0.2)P2$

If $P2 = 70\%$ and $P3 = 50\%$, then go to the Cloud.

If $P2 = 70\%$ and $P3 = 10\%$, then upgrade internal equipment and software.

■

[Curtain]

This article is available online in **[MOBILE-FRIENDLY FORMAT]**.

NOTE – This example follows similar logic and Decision by Professor J. Sussman used in his lecture to the Engineering Systems Division entitled, **DID BELICHICK MAKE THE RIGHT CALL?**

[READ BELICHICK PART 1 – PDF]

[READ BELICHICK PART 2 – PDF]
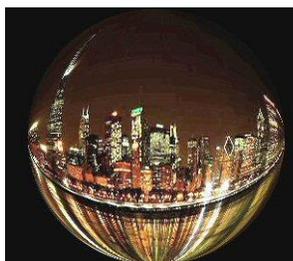
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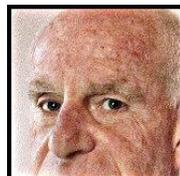
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