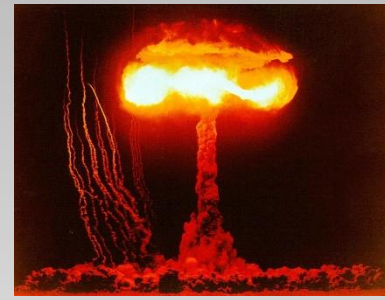


**eHealth
2016**



**Skills +
Knowledge**

Experience

Attitudes

**Catching Godot:
Competencies for Today's +
Tomorrow's Challenges**

**Dominic
Covvey**

**President +
Director**

NIHI

Introduction

- **Who am I?**
- **What is this presentation about?**
- **Why is it relevant?**
- **How can you contribute?**
- **What do we do next?**
- **Am I waiting in vain?**

eHealth 2016: Catching Godot Godot

Waiting for Godot:

Samuel Beckett play about waiting endlessly and in vain for someone named 'Godot'.

eHealth 2016: Catching Godot Signs of Trouble

- **Computer-caused errors: Signs of Harm (Huffington Post).**
- **Unintended consequences (Ash).**
- **Evidence that HIT is not cost-saving despite massive projections (American Journal of Med. - Himmelstein).**
- **Systems not substantially contributing to increasing efficiency, reducing costs or improving patient outcomes (J. of Health affairs).**
- **Computer reminders produced much smaller improvements than those generally expected from ...CPOE (CMAJ – Shojania).**
- **Stead taskforce findings (National Academies Press).**
- **The challenges of workflow, mgmt of change, adoption,...**
- **Our media and eHealth mis-management and fraud.**
- **Implementation dislocations (Nanaimo, Partners) and failures.**
- **Scuttlebutt: The 'I' in CIO stands for 'Impossible'!!**
- **Consistency globally.**

Note: Systematic reviews of Haynes, McMaster.

Signs of Trouble

IT Leaders



What I Think I Do



What My Mom Thinks I Do



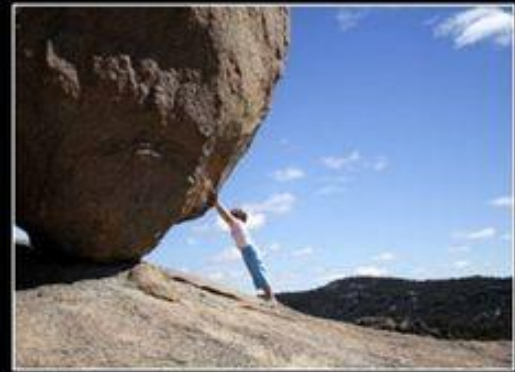
What Finance Thinks I Do



What Business Users
Think I Do



What Business Users
Want Me To Do



What I'm Actually Doing



eHealth 2016: Catching Godot Crucial Competencies in the Past



- 1960s-1980s:
 - **Knowledge of Hardware:**
 - Deep, wide and technical in the 60s and early 70s.
 - **Knowledge of Software Development:**
 - Basic and evolving tools – starting from switches and slowly getting 'environments'.
 - Software development was only minimally a science.
 - **Knowledge of 'Micro-Processes' only gradually going 'holistic':**
 - Started mainly with instruments + departmental processes in 60s and 70s.
 - Where extended to whole institutions: shallow, although exceptions.
 - By 80s, focus shifted to deeper understanding of the healthcare system.

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Crucial Competencies in the Past

- 1980s-1990s:
 - **Knowledge of Systems Technology:**
 - Became higher level, vendor-product oriented.
 - Move to formal software engineering, environments, full CS and serious systems.
 - Gradual entry of Information Science.
 - **Knowledge of Networks and Interoperability:**
 - Early networks were point-to-point and only gradually transitioned to Internet.
 - Memory of being ridiculed for suggesting use of early web concepts in mid-90s.
 - **Knowledge of Healthcare System:**
 - Deep, wide and detailed.
 - Moving gradually to their interaction as opposed to insular function.
 - **Knowledge of Psycho-social Aspects of eHealth:**
 - Emergence of full realization of preeminence of human factors



eHealth 2016: Catching Godot Crucial Competencies in the Past

■ Early 2000s:

■ **Pointing the Way:**

- Over 100 diverse professionals in CIHR-funded 2-year effort; Result = book defining Practical eHealth, Research HI, and Clinician Enablement competencies.
- Analyzed actual roles and functions of these professionals + derived Sk, Kn, Exp.
- Identified 22 competency categories + 100s of specific skills, knowledge elements and required experiences.

■ **Broad Areas Identified:**

- **Health Sciences:** human health and disease.
- **Healthcare:** systems for managing human health.
- **Information Science:** the nature structure and content of information.
- **Computer Science and Technology.**
- **Psycho-social Science:** human factors, interactions, org'l behavior.
- **Management Science:** human mgmt structure, concepts and activities.



eHealth 2016: Catching Godot Crucial Competencies in the Past

■ Mid 2000s:

■ **COACH Effort:**

- Probable intention: simplify; Possible effect: confuse.
- Id'd only professional tasking, not what is required to perform those tasks.
- A few parallel attempts were frustrating and relatively fruitless:
 - Particularly ICTC: Clinical Informatics is good example.
- 'Pointing the Way' accepted as most comprehensive effort; at least 15 others.
- **But none are truly complete!**

■ **Why?**

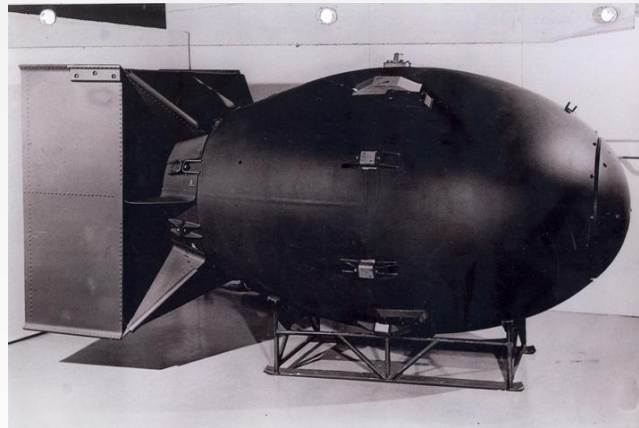
- Thankless task, many personal perspectives and biases (like severing of NI),...
- But real issue is that HI is a DYNAMIC field and a moving target.
- Also, there are multiple entry points (more on that later).



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Why Comprehensiveness of HI Important

**Think for a minute of nuclear weapons
(yep!)**



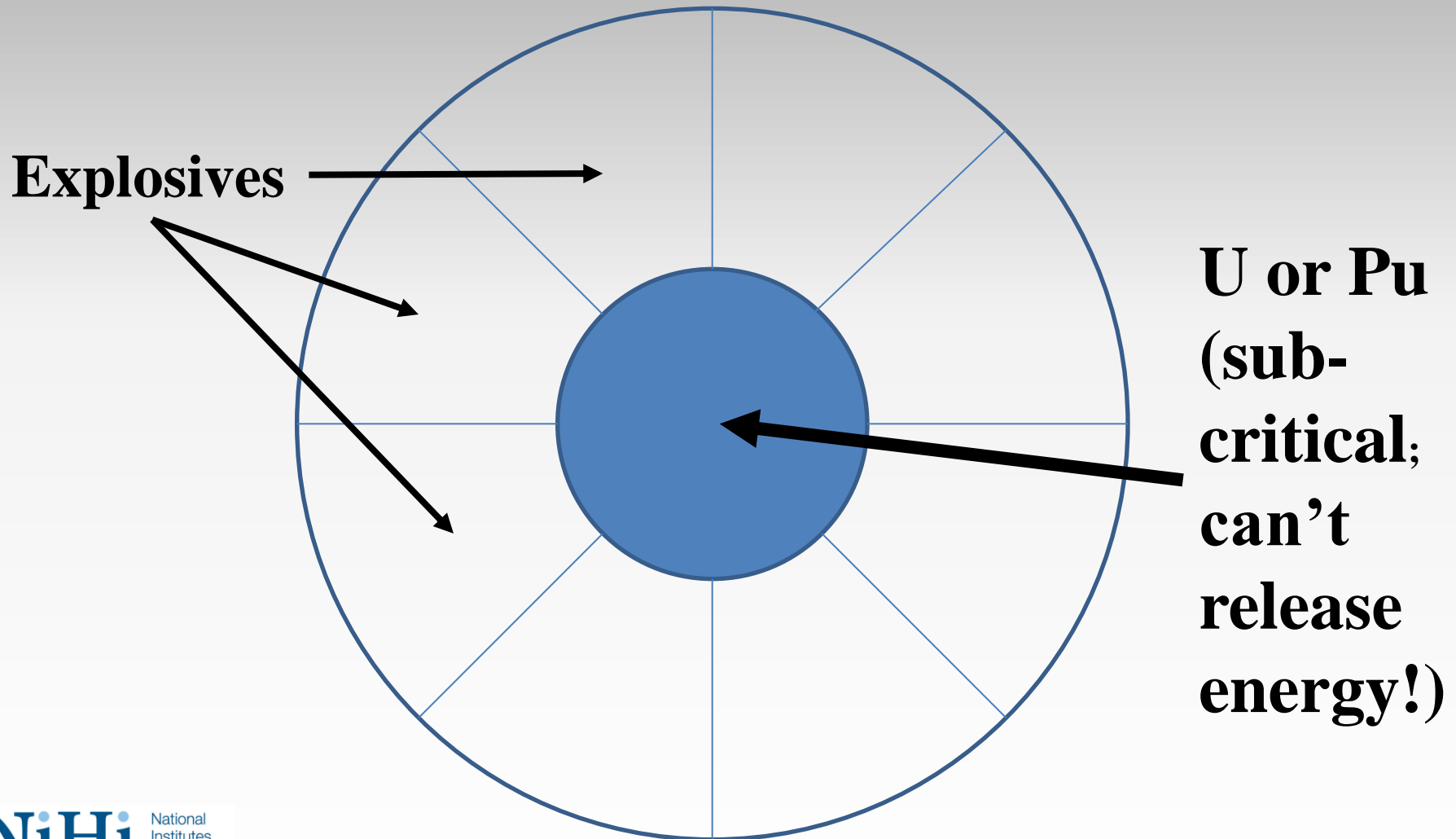
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Why Comprehensiveness of HI Important

- **In a fission weapon.**
 - The objective is to have a mass of Uranium-235 or Plutonium that is sub-critical – it won't explode on its own; needs to be 'assembled'.
 - Then to compress it and cause it to be a super-critical mass that will explode.
 - In other words, it will produce a vast amount of ENERGY!
 - What the heck has that to do with HI competencies?
- **Think of it this way:**

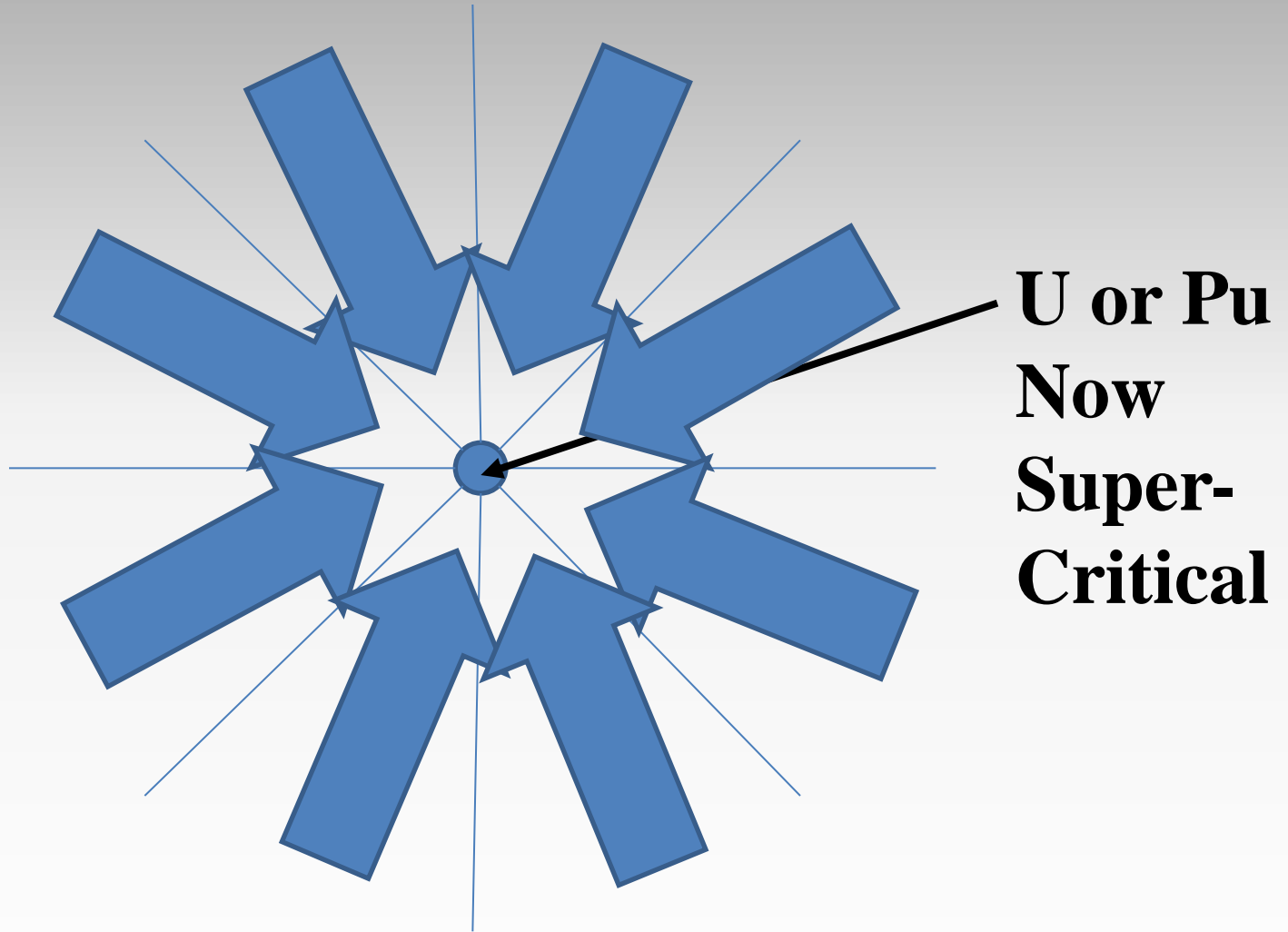
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Why Comprehensiveness of HI Important



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Why Comprehensiveness of HI Important



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Why Comprehensiveness of HI Important



Boom

We get the energy out of the nuclei!

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Why Comprehensiveness of HI Important

**Psycho-social
Science**

Health Sciences

Health Care

**Computer
Science**

Information Science

?????????

Technology

**Management
Science**



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Why Comprehensiveness of HI Important

- **Result in a nuclear weapon: A Fizzle!**
- **Result in eHealth: A Disappointment or a Failure!**

eHealth 2016: Catching Godot

Why Comprehensiveness of HI Important

- **What's missing?**
- **What prevents the professional from being fully effective?**
- **Note:** our and others' competency definitions fail to address required attitudes!
 - **A whole other issue!**

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What has Changed in our Domain?

- **In the simplified overview of HI competencies, whole fields are missing or misunderstood**
(e.g., Information Science vs Computer Science).
- **Needed Action:** Add and clarify the relevant competencies.
- **But, WAIT, things have changed!**

HI is a **DYNAMIC**
field!



eHealth 2016: Catching Godot

What has Changed in our Domain?

- **The emergence of Implementation Science.**
 - Mainly since the 1990s, but awareness really after 2005 (mine).
 - But it's been around and we've had awareness for a decade!
- **The in-depth realization that health care is a complex adaptive environment.**
 - Or at least a non-linear system (BMJ: XXX; thanks to D. Ritz).
 - Huge development and management implications.
 - Adaptive approaches = mission critical; Dynamic Workflow.
- **The escalation of the importance of Standards, Interoperability (both tech and semantic), and the concepts of Tangible Value and Integrated Evaluation.**
- **The almost intractable problems of Implementation.**



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What has Changed in our Domain?

- **Recently:** a paper indicated our competency definition was the most comprehensive, but only 50% of complete.
- **What's Missing?** **Lots!**
 - Attitudes and Values.
 - Policy (UofT program).
 - Observational Science (e.g., Grounded Theory, ...).
 - Details of Evaluation.
 - Details of CS and SE.
 - Process research and standards.
 - Details of Cultural (and other pre-intervention) Assessments.
 - Behavioral Science.
 - New areas that follow.



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What has Changed in our Domain?

- **Implementation Science:**

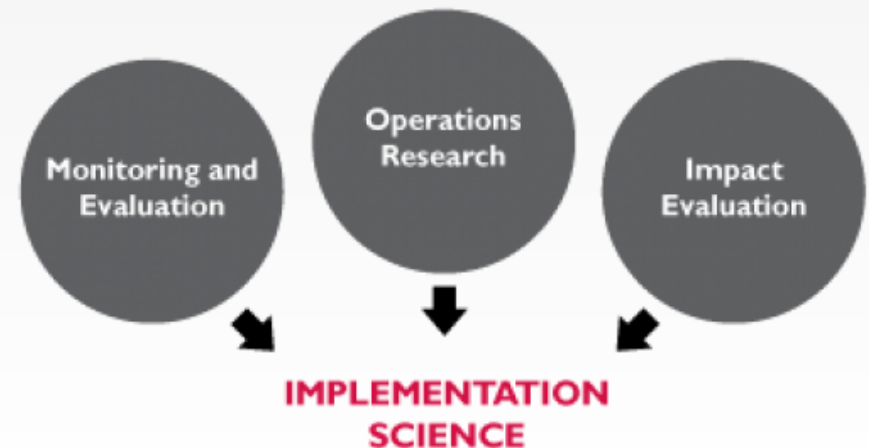
- Implementation science can be defined as “the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services”.

(Eccles MP, Mittman BS. Welcome to implementation science. *ImplementationSci.* 2006;1:1. doi: 10.1186/1748-5908-1-1.)



International
Organization for
Standardization

PEPFAR's Implementation Science Framework



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What has Changed in our Domain?

- **Complex Adaptive System:**
 - The nature of complexity.
 - Non-linear systems.
 - Fundamental uncertainty.
 - Emergent phenomena.
 - Near horizons for strategy.
 - New management paradigms.
 - Agile approaches: development, planning, budgeting,...
 - Adaptive project management.
 - Others...



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What has Changed in our Domain?

- **Standards and Interoperability:**
 - Technical standards.
 - Format standards.
 - Data standards.
 - Process standards.
- **Value and Integrated Evaluation:**
- **Tech standards, process standards and integrated evaluation are topics of Implementation Science.**

PEPFAR's Implementation Science Framework



eHealth 2016: Catching Godot Solutions to HI Competency Evolution

- **Individual professionals must have an 'Awareness Level' of competence in virtually all domains.**
- **Individual professionals must consciously choose the areas in which they will become expert.**
 - Probably wise to base this on credentialed areas.
 - But, no harm in a 'striking out in force'!
- **Groups of professionals must assess the challenges they face or will face and select others with competencies that fill the gaps among them.**
 - This determines recruitment priorities.



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Career Pathways

Entry	Next Step	Top Off	Experience
High School	Ideal: B of HI Other: See Col. 1	MHI/MCI/ eHealth	Projects, Practica, Co-op, Summer Jobs
Health Credential: BA/BS/BAHSc/MD/ BN/etc.	Prep Courses in CS/InfoSci/Soc/ Mgmt		
Technical Credential: BCS/Math/Eng/Tech	Prep Courses in HealthSci/ SocSci/Mgmt		
Social Sciences Credential: BA	Prep Courses in CS/InfoSci/ HealthSci		
Non-Degree Path	Selected Courses, Reading, Mentoring proportional to gaps.	Certificate in HI/ eHealth	Job Experience

eHealth 2016: Catching Godot Solutions to HI Competency Evolution

- **We need to recognize that more, deeper work needs to be done:**
 - In competency definition.
 - In education program intake.
 - In curriculum evolution.
 - In CE development and offerings.
 - In professional assessment.
 - In job description and professional recruitment.
- **It may be obvious, but it needs to be stated:**
 - Our professionals must be competent and our teams complete. This is not a reality show
 - called “The Amateur Hour”



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The Definition of HI

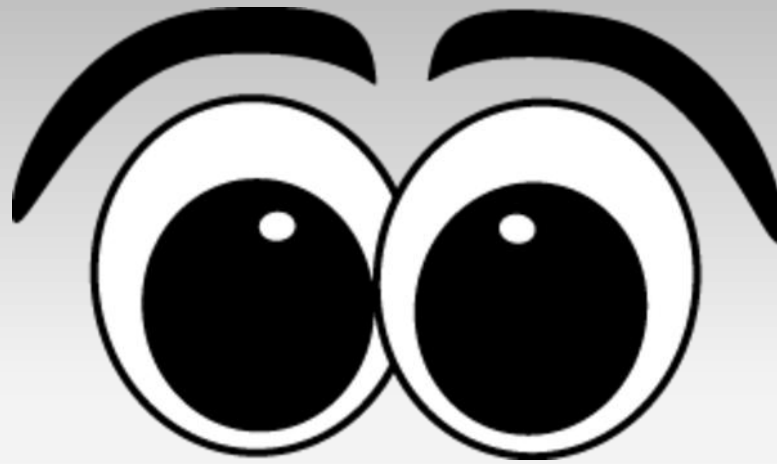


**To properly set the stage for
thinking about this:**

**Let's revisit and improve on the
definition of Health Informatics**

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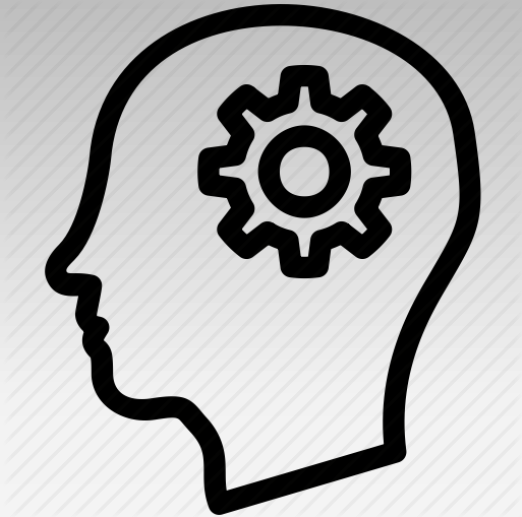
A More Meaningful Definition of HI



HI is the discipline that, firstly, aspires to comprehensively understand, in all their aspects, health and the health system, healthcare processes, and the roles, functions and needs of care providers, patients and other stakeholders.

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A More Meaningful Definition of HI



HI then conceptualizes, develops, applies and evaluates concepts, theories , structured methods, and information tools to address the need to evolve as efficient and effective a health system as possible that satisfies the needs of all stakeholders.

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Our Goal

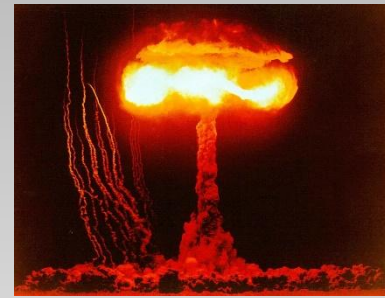
- **We face the overall challenge of enabling a more efficient and effective healthcare system:**
 - Serving all stakeholders in ↓ disease and ↑ wellness.
- **Our role related to eHealth is no less than delivering on that in any way possible.**
 - Not just implanting technology!
- **To do that, must release the full energy + quality of our professionals, their ideas and their skills.**
- **The only way to achieve that is through the assembly of competencies in our individual professionals and teams.**

Let's not FIZZLE!

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eHealth 2016



Skills +
Knowledge

Experience

Attitudes

Questions, Answers, Discussion
dcovvey@uwaterloo.ca

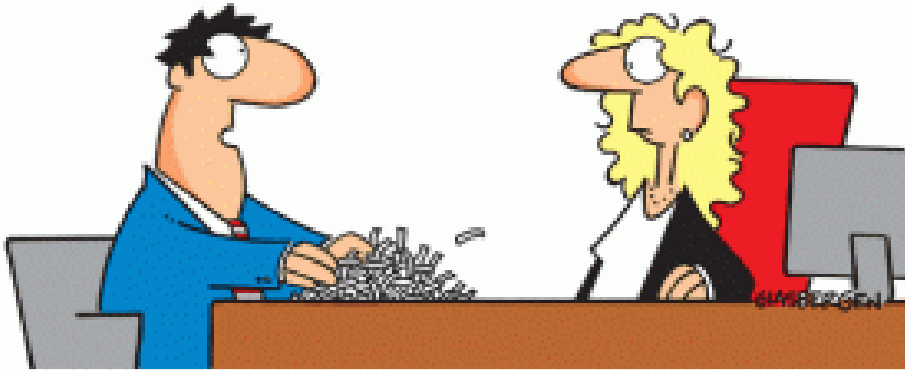
**Dominic
Covvey**

**President +
Director**

NIHI

eHealth 2016: Catching Godot Humor

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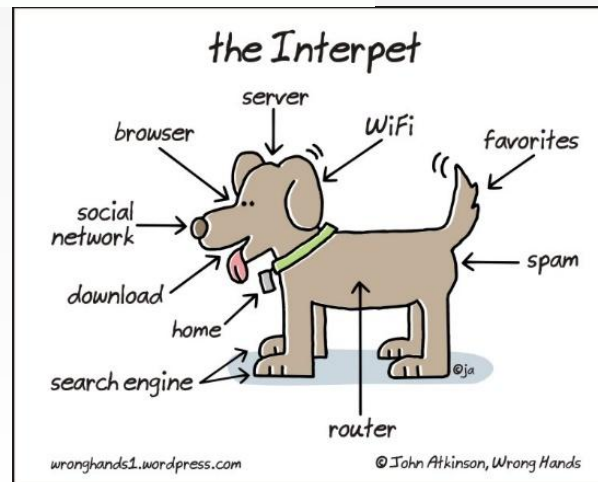


"I'm applying for the Information Security position.
Here is a copy of my resumé, encoded, encrypted and shredded."

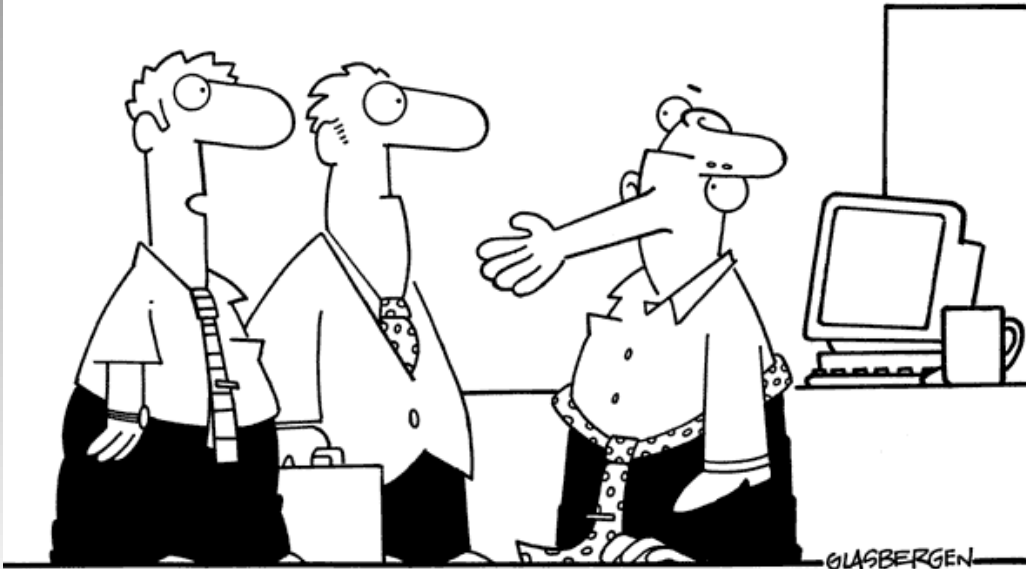
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"Just the same, it's nice to get an award."



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“That’s our CIO. He’s encrypted for security purposes.”





STRATEGY
RESEARCH
ANALYSIS
DEVELOPMENT
GROWTH
INNOVATION
PARTNERSHIP
MARKETING

A red vertical line is drawn through the letter 'E' in each word of the list. A black pen is shown to the right of the list.

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