

*Complexity in
Computer Systems:
a Risky Business*

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Why do we need Technology at all?

Technology transforms uncertainty into risk.

We 'explain', and thereby swap hopelessness,
for the optimism in a plan of action.

In other words we impose structure in order
to gain a tenuous handle on uncertainty.

(numerical) Algorithms + People

= (systemic) Risk

= Hazard + Opportunity

Managing Uncertainty?

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*"Though this be madness,
yet there is method in't"*

(Hamlet, Act II Scene 2)

*Method is the first, the last,
the only resort of the mediocre*

Definition of a Singularity:

*“they had to be lucky all the time,
we had to be lucky just once”*

*(Aspokesman after the Brighton bombing,
when they almost killed Margaret Thatcher)*

Go odhart's Law

"any observed

statistical regularity

will tend to collapse

once pressure is placed on it

for control purposes"

Beyond Good and e-Ville

Look toward the observable consequential risks
that occur when computers are integrated
into *Human Activity Systems*

Computers deal with objective
well-structured problems,
with detail.

They cannot cope with
subjective subtlety,
ambiguity and complexity

A good technology platform,
although *necessary*,
is not *sufficient* for success.

Success or failure with a technology
will be determined by
unique social, political, organizational,
and particularly personal factors.

Pablo Picasso

*"Computers are useless,
they only give you
Answers!!!!"*

BLAST-OFF

"you are at the top of

6 million parts,

all made by the lowest bidder!"

Michael Collins

The Price:

is here and now

The Cost:

accrues from here to eternity

A System

or

an Installation?

A System is what it becomes,
what it will become,
NOT what it is intended to be.

Systems misbehave!

Installations are linear,
systems are intrinsically non-linear

In a linear world,
the consequences of an Action
stop with a Reaction;

in the non-linear world of practice,
unforeseen consequences feed back
as a result of the inevitable complexity

Systemic Risk
Hazard or Opportunity?

Negative Feedback: reinforces stability
or Positive Feedback: the seed of Chaos

the Butterfly Effect

*Complexity increases to a point
where utility becomes reliance,
reliance becomes dependence,
and the Law of Diminishing Returns
precipitates a galloping descent
into Nightmare*

The first step fallacy

*“they think they are reaching for the moon,
but all they’ve done is climb the nearest tree”*

Herbert Dreyfus

President Pompidou:

There are three Roads to Ruin,

Women, Gambling and Technology!

Women are the most Measurable,

Gambling is the Quickest,

but Technology is the most Certain!

Priest:

“do you renounce the devil
and all his works?”

Niccolo Machiavelli:

“This is no time
to be making enemies”

The Luck stops There
Defensive use of e-mails

Responsibility

versus

Authority

The Shell oil reserves scandal

The van de Vijver e-mail:

*"I am becoming sick and tired
about lying about the
extent of our reserves"*

*Shell fined \$120 million by the SEC,
and £17 million by the FSA*

*“Every revolution evaporates
and leaves behind only the
slime of a new bureaucracy”*

Franz Kafka

the 'Glass-Cockpit Syndrome'

omnipresent computer screens distract,
causing confusion and errors of judgement

1) end users rely entirely on the system
without exercising any judgement.

2) ensuing information overload results
in users ignoring many pieces of
(sometimes very important) information.

Bureaucracy

'normal' versus 'singular'

*Discretion or
self-referential certainty?*

Dennis Healey:

"When you're in a hole,

STOP DIGGING!!!!"

Optimistic rationality

Monday:

*What I say, I say now,
I say without
condition,*

*that science is but
the latest, greatest
superstition*

Alan M Edison:

"New Technology

owes Ecology

an Apology!"

Friedrich Nietzsche:

*"Madness is something rare in individuals,
but in groups, parties, peoples, ages
it is the rule."*

The Madness of Control Freaks

Human thought is mere calculation;
we are biological analogue computers.

Their Hidden Agenda:

- 1) a number can be a meaningful representation of human experience; and
- 2) arithmetic operations on such representations, implemented on a computer, can produce 'rational decisions' about, and can control the human condition.

The Uncertainty Principle

*There's no point in measuring something
if it changes the moment it is measured,
as a direct result of being measured.*

Profiling?

Peter Principle of Computerization

Individuals and Computers are
promoted to the level of their

INCOMPETENCE

But worse

computers magnify and amplify
the incompetence of all those around

The figures don't lie?

*"It's not the figures lying,
it's the liars figuring"*

Mark Twain

Atomism

Similarity = Sameness

False Opposites:

Pretend to be serious then

Pretend to be funny

Friedrich Nietzsche:

"capricious division and fragmentation"

Shakespeare

*"The fault, dear Brutus, lies not
in our stars, but in ourselves ..."*

Niklas Luhmann

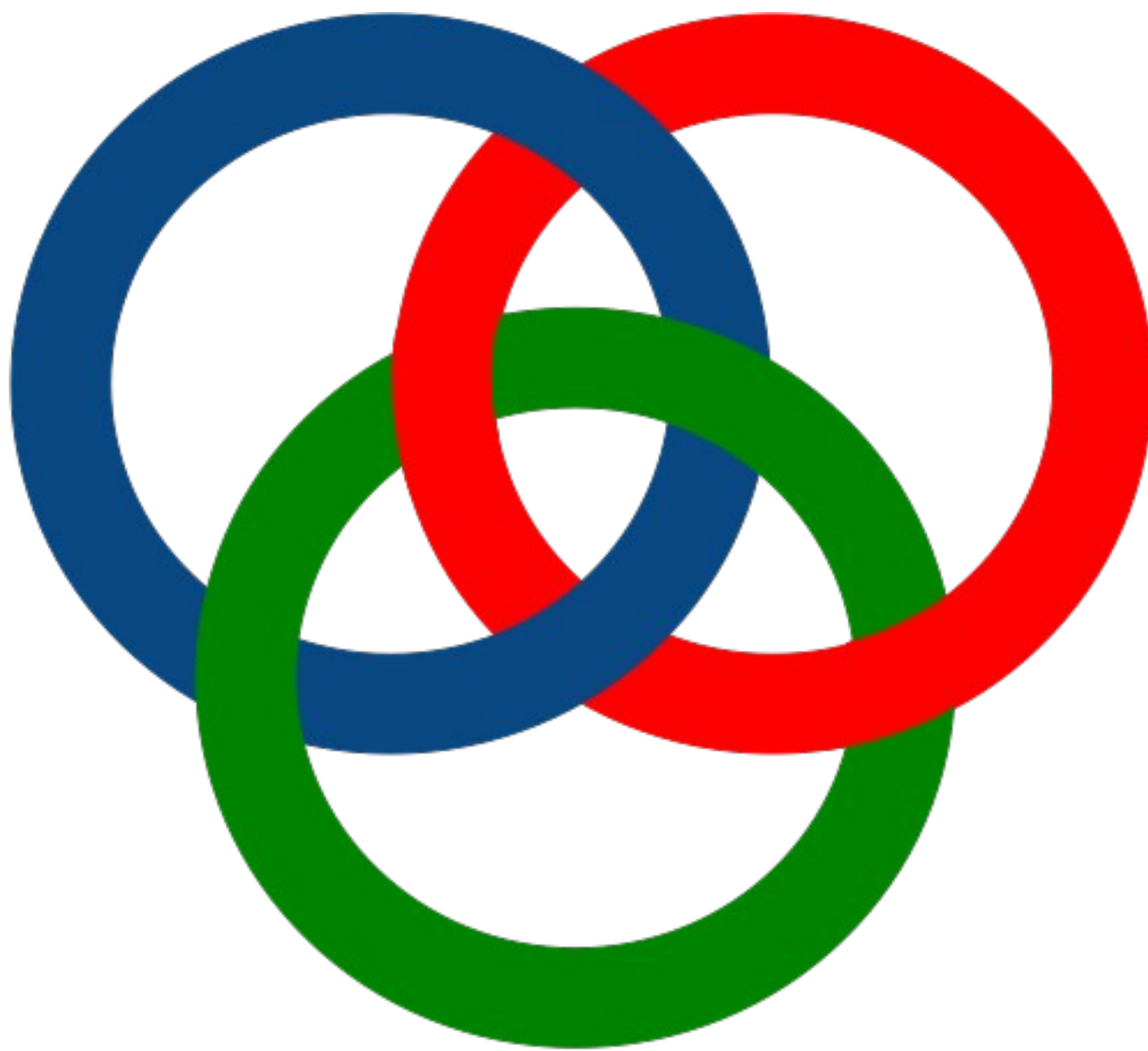
The Fallacy of the Residual Category

Niklas Luhmann:

"The concept of the environment should not be misunderstood as a kind of residual category.

Instead, relationship to the environment is constitutive in system formation."

Structural Coupling



The Borromean Rings

the two artificially separated parts
continue to operate (and interrelate)
as the unobservable whole.
Because of this asymmetry
(between the world as it is,
and as it is observed),
all observation is conditional,
but those conditions are necessarily
unobservable, unappreciable, uncertain.

Those truncated structural couplings,
so casually discarded by observation,
stay on as **uncertainties**
and thus, as **risks** to the observer
in any further observations,
and they can reassert themselves
in the most inconvenient ways.

*The nine most terrifying words
in the English language:*

"I'm from the government.

I'm here to help you"

President Ronald Reagan

*"Our society is run by insane people
for insane objectives.*

*I think we're being run by maniacs
for maniacal ends ..."*

John Lennon