The Next Ten Seconds

Building Anticipatory Systems for Risk

Rob Smith / Trevor Law

Anticipation:

“A prior action that takes into account or forestalls a later action.”

Merriam-Webster

AIS Implementations

- Automated driving systems
- Accident avoidance systems
- Military field ops systems
- Risk management systems
- Weather prediction
- Autonomous research mechanisms
- Earthquake prediction
- Software and network security management
- Control systems
- etc.

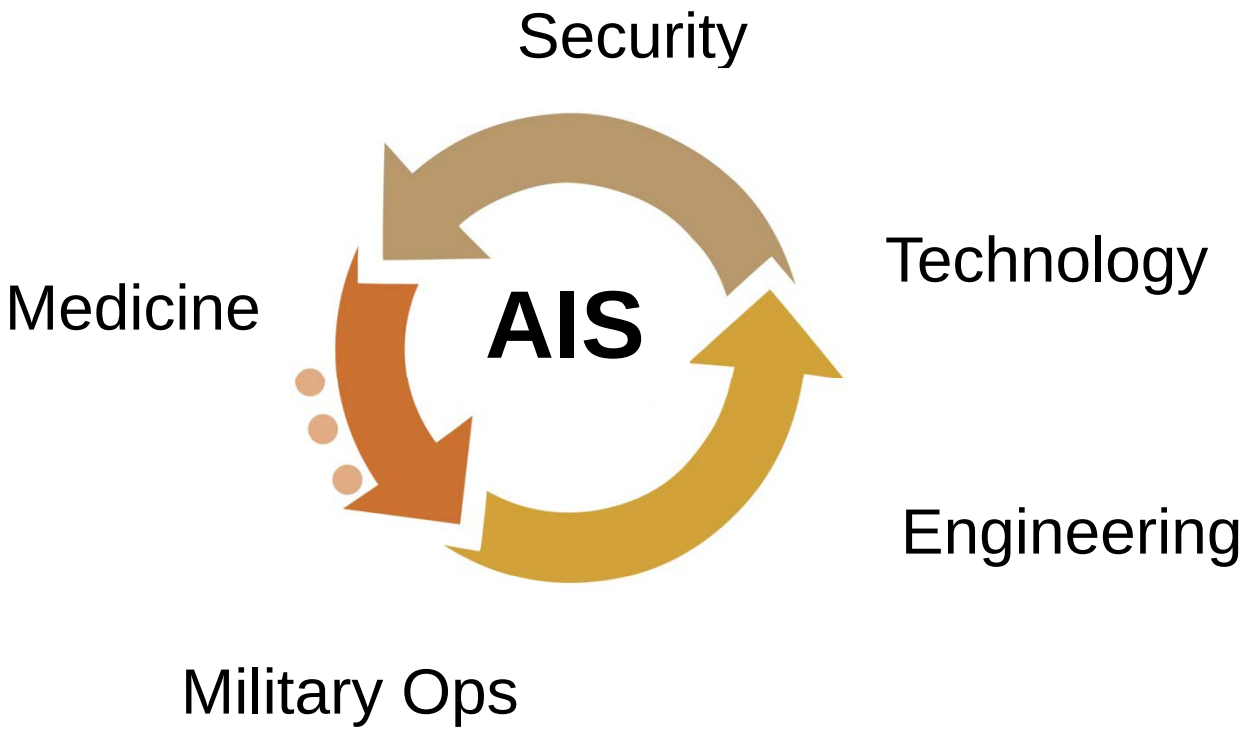
Goals for AIS Development

1. Produce anticipatory views of the future

   Highly accurate
   Exceptionally fast

2. Crossing the gap between mitigating risk and eliminating risk will yield very large benefits in hyper system design.

Areas Where AIS Can Reduce Risk



The relationship between near instant anticipatory information systems (AIS), risk management and the human mind.

Anticipation and human decision making provides a system design framework that will lead to:

Faster processing methodologies

Rapid machine learning

MLS – Massively Leveraged Systems

- Distributed Processing
- Ultra light location based event results delivery
- Distributed data storage structures

Anticipatory Information Systems are:

Deterministic

*Determinism: a theory or doctrine that acts of the will, occurrences in nature, or social or psychological phenomena are causally determined by preceding events or natural laws **

Not Stochastic

*Random; specifically : involving a random variable involving chance or probability : probabilistic **

*** Merriam Webster*

Data Storage in the Human Mind

The brain stores data in a special way for faster retrieval

Every brain does this uniquely

AIS achieves this by analysing and adding additional data to incoming data during storage

And by grading and re-grading information constantly

Eliminating risk with AIS requires new methodologies

- Flow methodologies
- Automated risk mitigation event initiation frameworks
- New data change identification and analysis methods

Managing Risk – A System View

- Detect a change to the world
- Identify the change
- Validate the risk level of the change
- Determine mitigation options
- Execute the mitigation
- Adjust our forward anticipatory view
- Do this constantly while minimizing resources

How the Human Brain Detects Risk

We detect a change to the world

By anticipating a normal world

And measuring the difference

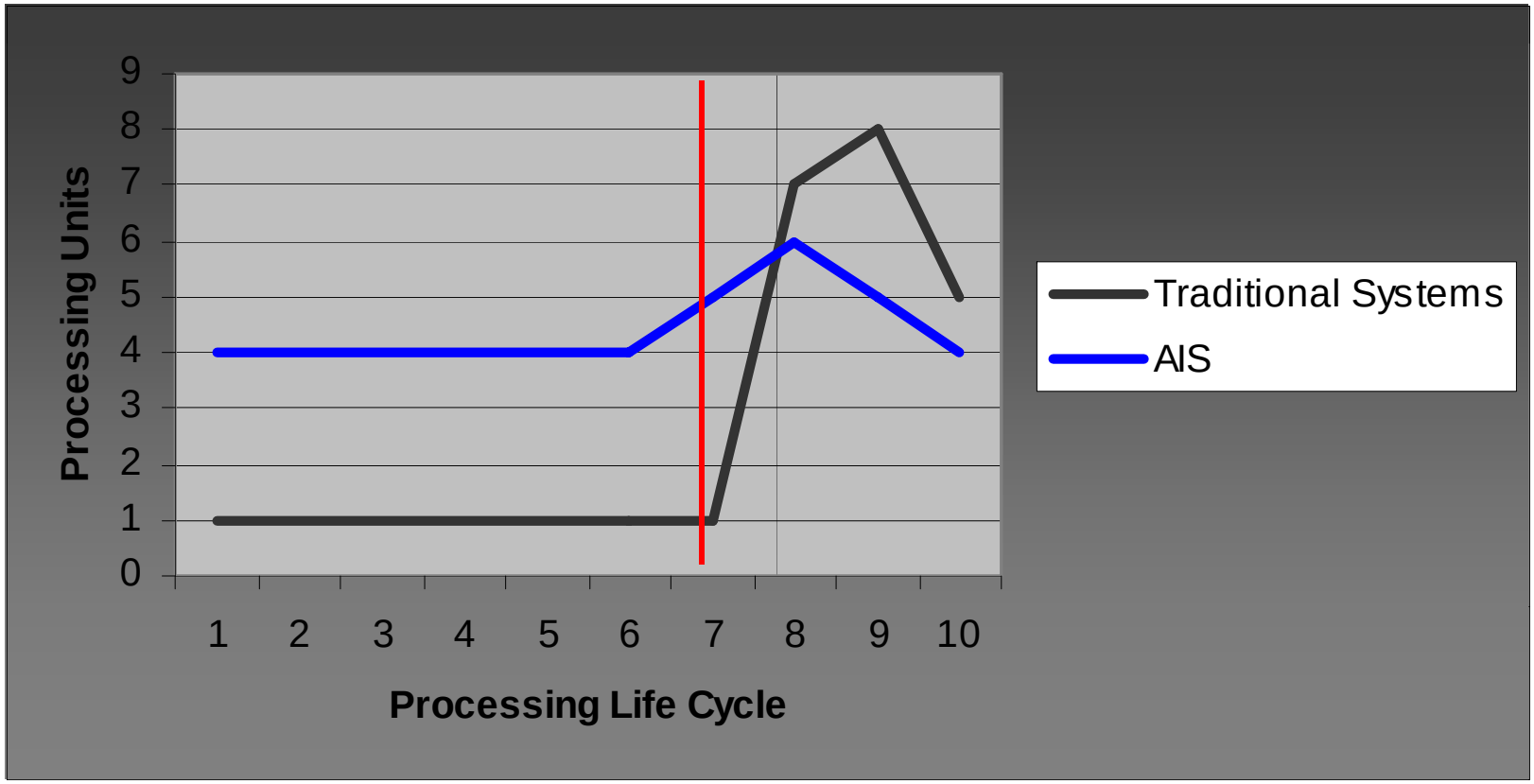
Instantly

Managing Risk – A Human View

Identify the data (sense stimulus)
Match it to the view we are holding
Analyze the change
Determine the threat level in the change
Anticipate what will happen if we don't do anything
Decide how to respond to protect ourselves
And we respond

New technological designs in information storage and retrieval required for near instantaneous analysis systems.

Perpetual Processing vs Traditional Processing



Risk Event

AIS Processing Formula

Only work when required **+**

Only process what you need **+**

Use system time and resources effectively **=**

Perpetual Processing

Some Elements Processed by AIS

- Velocity
- Relational data
- Stored data set
- Delta variance
- Threat level
- Input data set

Types of AIS stored data sets

- Instantiated view
- Frame of reference
- Anticipated view
- Delta set
- Delta variance
- Tolerance
- Relevance
- Delta Relevance

Hyper Reactive Systems

Systems that continuously respond and react and process massive data with extreme speed.

AIS are hyper reactive by design

Flow Engine Elements

Agreements
Entity
Position
Nodes and waypoints
Directionality
Relative Position
Distance
Velocity
Quality
Priority

Benefits of Flow Engine Frameworks

Agnostic multidimensionality
Distributed storage
Hyper reactive data processing of real world objects

Multidimensional Design

AIS Flow Dimensions

1. Flow

2. Change, velocity, directionality , value, etc.

3. Frame of reference and links

4. Changes over time

5&6. Relevance, correlation, correlated relevance

7+. Etc. Etc. etc

Theory of Diminishing Returns

The more information added to an AIS, the closer the anticipated view becomes to actual future events at successively smaller increments.

Perfect anticipation is actually looking into the future

Anticipation vs Prediction

Prediction - to declare or indicate in advance; especially : foretell on the basis of observation, experience, or scientific reason

Anticipation - a prior action that takes into account or forestalls a later action

Merriam Webster

The path to self erudition systems based on advanced AIS risk analysis and results assessment.

AIS and Self Erudition

AIS anticipated views are continuously adjusted (perpetual processing) to improve the view and are by design, self correcting and self improving.

Practical Applications for AIS

Military Applications

In theatre ops feeds from:

- Drone video
- Live intelligence
- Communication chatter and triangulation
- Friend communication analysis
- Fixed surveillance
- Past Intelligence
- Area correlation
- Geo-positional relevance
- Net data

AIS will combine and analyse the data to determine threat types, levels, locations and mitigation options and deliver data and options to rugged ground personnel systems in real time.

Security Operations

Events are preceded by certain exhibited markers or actions

Unique to the individual

Unique to the situation, time, directionality, velocity, relevance and correlation, etc.

Anticipate the actions of targeted individuals based on things they do.

Software and Network Security

AIS provides methodologies that can improve the detection and instant event initiation necessary to defend and isolate cyber attacks before they can spread or do any damage.

New methods for identifying and neutralizing sources.

Space Technology

Automated mission self erudition and adaptation based on sensory analysis.

Experiment divergence and change management based on actual vs anticipated result set analysis and automated event initiation.

Research and Medicine

Experiment self erudition

AIS allows for multidimensional test regimes and streams instead of linear test methodologies

Significantly reduces result times and provides a greater number of result outcomes within the same time frame

Decision and Control Systems

Improved machine decision making

Improve automated event initiation

“Sometimes in order to see what it is we cannot see we need only look away long enough to understand the difference.”

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