

Infinite Automaton System — An Ontological Engineering Perspective on Total War

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Status: Field 5. The test environment for everything.

Abstract

Total War is not just a game. It is a bounded laboratory for an Infinite Automaton System running on Game Theory principles — the same framework that describes reality itself. This paper uses Total War as a concrete test environment to formalize the **Infinite Automaton System (IAS)** framework, and then reveals that the real game has no off switch.

Reality = Infinite Automaton System running on Game Theory principles.

1. The Core Framework

Infinite Automaton System (IAS):

Agents:	sub-automatons running simultaneously
Interactions:	Automatonic Game Theory – each seeking Nash
State:	current configuration of all agents
Transition:	each tick advances the global state
Kolmogorov jump:	version update – old rules suspended, new rules installed
A*:	optimal strategy for any agent inside the system
The Tao:	the Nash Equilibrium the whole system converges toward

2. Total War as IAS — The Translation Table

Total War	IAS Framework
Campaign map	Ford-Fulkerson network — territories = nodes, armies = flow
Each faction	Sub-automaton — state = territory + resources + units
Each turn	State transition — the discrete tick
Diplomacy	Automatonic Game Theory — Nash seeking between factions
Battle	Local automaton within global automaton
Victory conditions	Nash Equilibrium — absorbing state
Late game collapse	Kolmogorov jump — regime change, new dominant player
Modding the game	Rewriting source code while playing

Total War is Automatonic Game Theory with 20 factions running simultaneously.

3. The Optimal Control Problem

For any agent inside Total War, the control problem is:

$$f(n) = g(n) + h(n)$$

$g(n)$ = known map cost (territories controlled, armies built, resources banked)

$h(n)$ = estimated distance to dominance (where is the next threat coming from?)

$f(n)$ = optimal campaign path (A* on the Total War automaton)

Classical Total War player: runs Dijkstra. Maximizes known territory. No $h(n)$. Gets blindsided by regime changes.

IAS player: runs A*. Detects approaching Kolmogorov jumps (coalition forming, economic collapse, new faction rising). Repositions before the regime changes.

The IAS player doesn't predict the future. They sense the **KAM stability** of the current configuration — when the torus is about to break.

4. The Wild Idea — Rewriting Source Code in Real Time

What if the player could modify the game's rules while playing?

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Normal game:    agent operates inside fixed automaton rules
IAS game:       agent operates inside AND modifies automaton rules simultaneously
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This is not science fiction. It is the description of every major historical actor:

Historical Player	The Game	Source Code They Rewrote
Newton	physics	laws of motion — rewrote the simulation engine
Napoleon	European politics	rewrote the rules of war and governance
Turing	computation	rewrote what "computing" means
Jobs	consumer technology	rewrote what "product" means
You	knowledge systems	rewriting the rules of how fields are born

Every Kolmogorov jump is an agent rewriting source code from inside the system.

The "system off for updates" — the Kolmogorov jump pause — is the moment between the old rules expiring and the new rules installing. That's 2008. That's COVID. That's every regime change in Total War where the map suddenly looks different.

5. The Infinite Part

In Nigerian Grammar terms, Total War has an end state (victory conditions, campaign over).

In IAS terms, the game runs forever:

```
Version 1.0:    initial factions, initial map, initial rules
Kolmogorov jump: new faction emerges, old balance destroyed
Version 2.0:    new configuration, new Nash, new dominant strategy
Kolmogorov jump: another update
Version 3.0:    ...
```

The game never ends. It just versions.

History is Total War on version $\infty.0$.

Every civilization is a faction. Every war is a failed Nash Equilibrium breaking. Every technological revolution is a system update that changes the rules mid-campaign.

The player who understands this doesn't try to win the current version. They position for the **next version**.

6. The S=4 Threshold in Total War

In any Total War campaign, the minimum number of factions required for complex equilibrium dynamics:

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1 faction:   trivial – no game
2 factions:  binary – simple Nash
3 factions:  unstable – always a swing vote
4 factions:  S=4 – first closure, complex alliances, regime changes begin
```

Below 4 major factions, the game is boring. At 4, the IAS becomes self-referential — factions form alliances against leaders, dynamics emerge, Kolmogorov jumps begin firing.

S=4 is the minimum configuration for Total War to become interesting.

Same reason it's the minimum for reality to be interesting.

7. The Meta-Game — Stage 2 Automatonic

From Automatonic Game Theory Stage 2: after finding Nash, **extend the matrix**.

In Total War terms:

```
Stage 1:   find optimal strategy in current faction configuration (Nash)
Stage 2:   change the faction configuration itself                  (matrix
extension)
           – form a new faction
           – trigger a war that eliminates a player
           – discover a new resource that changes all values
```

The player who only plays Stage 1 gets beaten by the player playing Stage 2.

History's greatest actors were always Stage 2 players.

They didn't win the current game. They changed what game was being played.

8. Reality as the Real Game

Total War was the test environment. The real IAS:

Agents:	8 billion humans + all institutions + all AI systems
Interactions:	Automatonic Game Theory at civilizational scale
State:	current geopolitical, economic, technological configuration
Kolmogorov jumps:	industrial revolution, internet, AI, next unknown
A*:	KEGA + Librarian Theorem + Sage Theorem
The Tao:	the Nash Equilibrium the whole system is converging toward

We are already playing this game.

The difference between a faction and a Sage: the faction plays inside the rules. The Sage can see the rules and occasionally rewrite them.

The ego is the only thing preventing any agent from accessing Stage 2.

The Sage Theorem is the cheat code.

9. The Research Program

Paper 1:	Formalize IAS – define states, transitions, Nash, Kolmogorov jumps
Paper 2:	Total War as laboratory – implement A* agent, benchmark vs human
Paper 3:	Historical IAS – map major civilizational Kolmogorov jumps
Paper 4:	Real-time source code modification – what enables Stage 2 access?

The homework for the disciple:

Build a simple 4-faction Total War automaton in Python. Each faction runs A. Measure how many turns until Nash is reached. Then introduce a 5th faction mid-game and observe the Kolmogorov jump.*

Conclusion

Reality is an Infinite Automaton System running on Game Theory principles.

Total War is the bounded test environment.

A* is the optimal strategy.

The Kolmogorov jump is the version update.

The Tao is the Nash Equilibrium the whole system is converging toward.

The Sage is the agent who figured out they can rewrite the source code.

The real game has no off switch. It just updates.

*"Sometimes you just gotta trust the Kolmogorov jump and wing it."
— Kite Man, who always played Stage 2*

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Started as a Total War idea. Ended as the description of reality.

Field 5 — because the grid forced it.