

LUCUMIA: A GAMING SIMULATION FOR THE ANALYSIS OF CONFLICTS MANAGEMENT PROCESSES

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ABSTRACT

This article presents a family of variously structured gaming simulations for training which have been once used to teach and experiment the learning tools of **Systems Dynamics Analysis**. These games, named after their prototype, are called *The Games of Lucumia*. Here we present also the results of a game modelled by the participants based on **Systems Dynamics** techniques.

1. The Games of Lucumia

The original simulation, *Lucumia*¹, can be played by up to 100 people divided into five teams and last (at least) two days.

Lucumia is a *happy island*, partly Utopia and partly Trobriand Islands, inhabited by two separate but peaceful populations, very roughly characterized as **Peasants** and **Fishermen**, wherein an unfortunate storm shipwrecks three groups of astonished invaders: the **Warriors**, the **Merchants** and the **Scientists**.

Which community ties (if any) will rise? Will the little land resources suffice for everybody? And what about epidemics? Traditions? Social structure?

The role-play (it is, in fact, a very slightly structured gaming simulation) is complicated and moved by a mysterious **Old Man of the Mountain** who embodies the island's past, its equilibrium and fears.

For the game are necessary five closed but not distant places which could be "visited" and which a "newsagency" should inform about the development of the groups dynamics.

From the prototype of *Lucumia*, other variously structured gaming simulations have been designed.

*Lucumia Felix*² is the first which shall refer to in our presentation (see 2).

1. *Lucumia* has been designed by Arnaldo Cecchini for a Seminar organized by ARIPS of Brescia (1988).

2. *Lucumia Felix* has been designed by the Authors for a training course organized by a Trade Union (CGIL) in Bologna (1988), the course was directed by Paolo Marcato.

There is, then, the game **Amate Sponde**³ whose aim is to set up an economically efficient community starting from three variously skilled groups and a group of buyers.

In three islands live the **Olympian** (shipowners), the **Masters** (who draw nautical charts and run a navigation school) and the **Reckless** (seafarers and fishermen).

The inland seas abound in fish and are well-known, but the fish is of a poor quality; the **Happy**, who live in the **Great and Terrible World**, show a lessening interest in it.

In the open seas a better quality fish lives, but sailing there is dangerous and the new fishing technology has not been well tested.

The "producer" groups must negotiate to:

- * charter ships;
- * buy, produce and use nautical charts and new nets;
- * instruct and train high sea pilots;
- * build new ships;
- * establish fishing programmes and selling strategies;

in short, they have to set up an efficient **Community of the Best**⁴.

They also have to meet the quality fish demand of the **Happy** and try to coax them in a long term plan: a computerized programme gives step by step results.

The game may be played by 35-40 people per Community; the competition is between 2 to 4 Communities; the winner is the group of the better-off Community which shows the best performance of the game aims.

Within this group, the player that has obtained the best result is appointed **Regent of the Great Federation of the Best and the Happy**.

A further evolution is represented by the game **Einland**⁵; even Einland is (was) a happy island, inhabited from time immemorial by two quite different but perfectly integrated populations: the adventurous **Fishermen** and the prudent **Peasants**, who run the island wisely, without any written constitution or law, fully democratically and basically egalitarianly; the island has very few contacts with the distant "external world" and is economically self-sufficient.

One day, however, the unexpected occurs: some foreigners land on three different places: they are extremely different (what are their interests? It has to be found out and, once found out, it will appear that their interests are carefully targeted), they are numerous and apparently intend to settle on the island: who are they? what do they want? how can they be contacted? how to deal with them?

The equilibrium is broken: will it be possible to build a new one? on which conditions? with which changes in the island socio-economic structure and institutional order?

In eight steps the participants (15-30) will face the consequences of the old balance break and of the difficulty in building a new social model. The players' decisions will bear on the island economy

3. *Amate Sponde (Loved Shores)* has been designed by Arnaldo Cecchini, Marisa Cengarle e Miriam Frau (1991).

4. In Italian the acronym of the three communities forms the word *Ottimi* which in English means *Best*.

5. *Einland* has been designed by Arnaldo Cecchini, Marisa Cengarle e Alessandra Ferri; graphics by Miriam Frau and software by Silvio Celegon (1991).

("controlled" by a computerized dynamic model), but the decisions depend on a wise time management, on devising and agreeing on strategies, on being able to negotiate, to take decisions, to "lead", to react to unforeseen events and the "unexpected". During the simulation the players constantly assess the skills and the performances of the leaders and, periodically, "control" the distribution of power on the island (it is the first metalevel of the game).

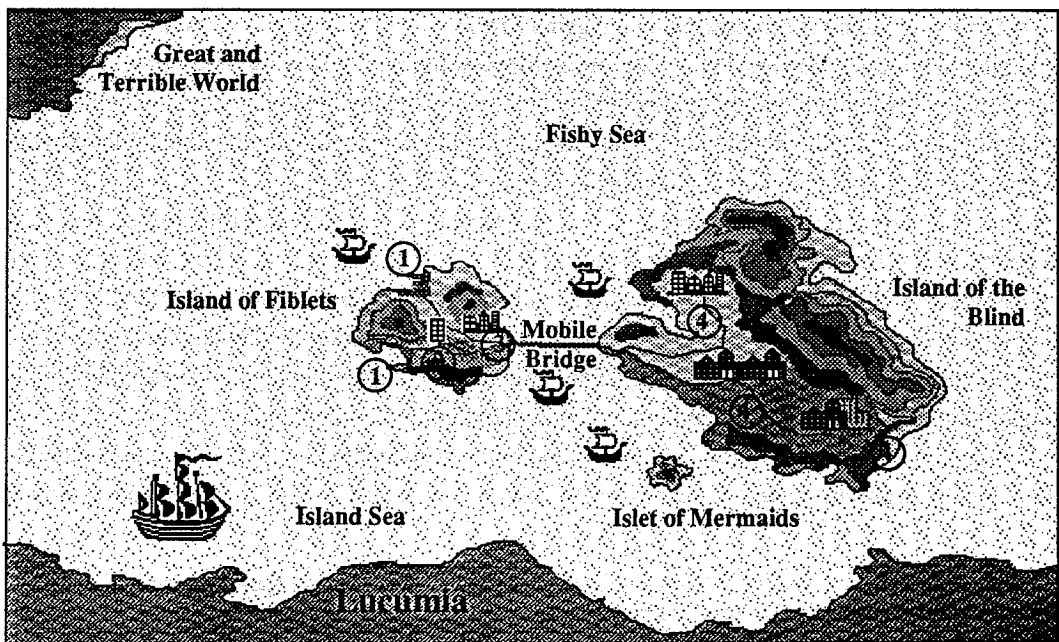
Game results and "metaevaluations" are processed in "real time" and the debriefing is based on a substantial report about the game progress and the players' evaluations (it is the second metalevel of the game).

The whole simulation requires an hour of introduction (possibly the night before), a whole day of gaming and another day of structured debriefing. The game is for people who have or will have managing responsibility and run activities, people, enterprise resources and outcomes, or in a socio-political context.

2. Lucumia at work

As we said above, an intermediate version of this game (Lucumia Felix) has been designed for a training course to trade union trainers; the four day course saw all the participants fully immersed in a fictional world. Every evening a debriefing on the game dynamics was built using the "language" of the Systems Dynamics.

2.1 The world of Lucumia



- 1) Harbours 2) Polytechnic 3) Printing House 4) Nautical Instruments Factories

This time the island (the little **Island of Fiblets**) is inhabited by scientists and by compasses and nautical instruments merchants. It is linked by a mobile bridge to the island of the **Blind**, powerful and rich, owners of the bridge, the fleet and the nautical instruments factories. The **Fibs** have shipping contacts with the **Continent of Lucumia**, which lies across a small strait; the **Lucumians** are hard-working fishermen and sailors, obviously economically connected to the **Blind**.

2.2 *The inhabitants and their tasks*

As it can easily be imagined, there is a sort of economic equilibrium, however unstable and conflictual, among the three communities (that we shall call the **Federation of the Folli**⁶): the **Blind** charter ships to the **Lucumians** and sell wholesale compasses and nautical instruments to the **Fibs**, who, on their turn, improve and sell them to the **Lucumians**, who also study the art of navigation in the great *Sea Polytechnic* run by the **Fibs**.

The students who from **Lucumia** go to **Fiblets** are called **Listeners**. Also the **Listeners** form a temporary team; an educated **Lucumian** considers himself "different" from the rude fellow countrymen that can only sail and fish. Another team, however, formed during the game, is in ambush: the **Vultures**, born by a "secession" of the **Fibs** and also by some **Lucumians**, will set up on a piece of the island and compete with the **Fibs** on the *ars navigandi*.

By various raids the **Vultures** often take hold of the bridge, interrupting the communications between **Fiblets** and the **Blind** and establishing direct contacts with the nautical instruments manufacturers.

The game includes the presence of the **Old Man of the Mountain**, depositary of wisdom, tradition and lawfulness (the role is held by the game conductor).

The situation is the following: the **Blind** are officially connected to the **Fibs**, but do not approve of their exclusive nautical "know-how". Consequently, they secretly do not oppose the **Vultures** (the naval block is rather weak); the **Lucumians**, always mistrustful of the **Fibs** do not love the **Vultures** either and try to exploit the situation so as to renegotiate their relations with the two islands. Among the **Blind** there is also a secret sect, the **Mermaids**, who meet at night in the **Islet of the Mermaids**, composed of fanatic worshippers of the **Bearded Goddess**, conservative and enemies of every form of scientific "knowledge": they secretly contrive to spread their creed among the **Lucumians** ("no nautical instrument can save you without the support of the **Bearded Goddess**!").

The equilibrium is broken: there seems to be a war of all against all.

This happens during the first day of game: and now comes the best!

There is no point in examining entirely the subsequent dynamics as they mainly depend on the players, let us analyse first instead the data offered to the teams to "limit" their decisions.

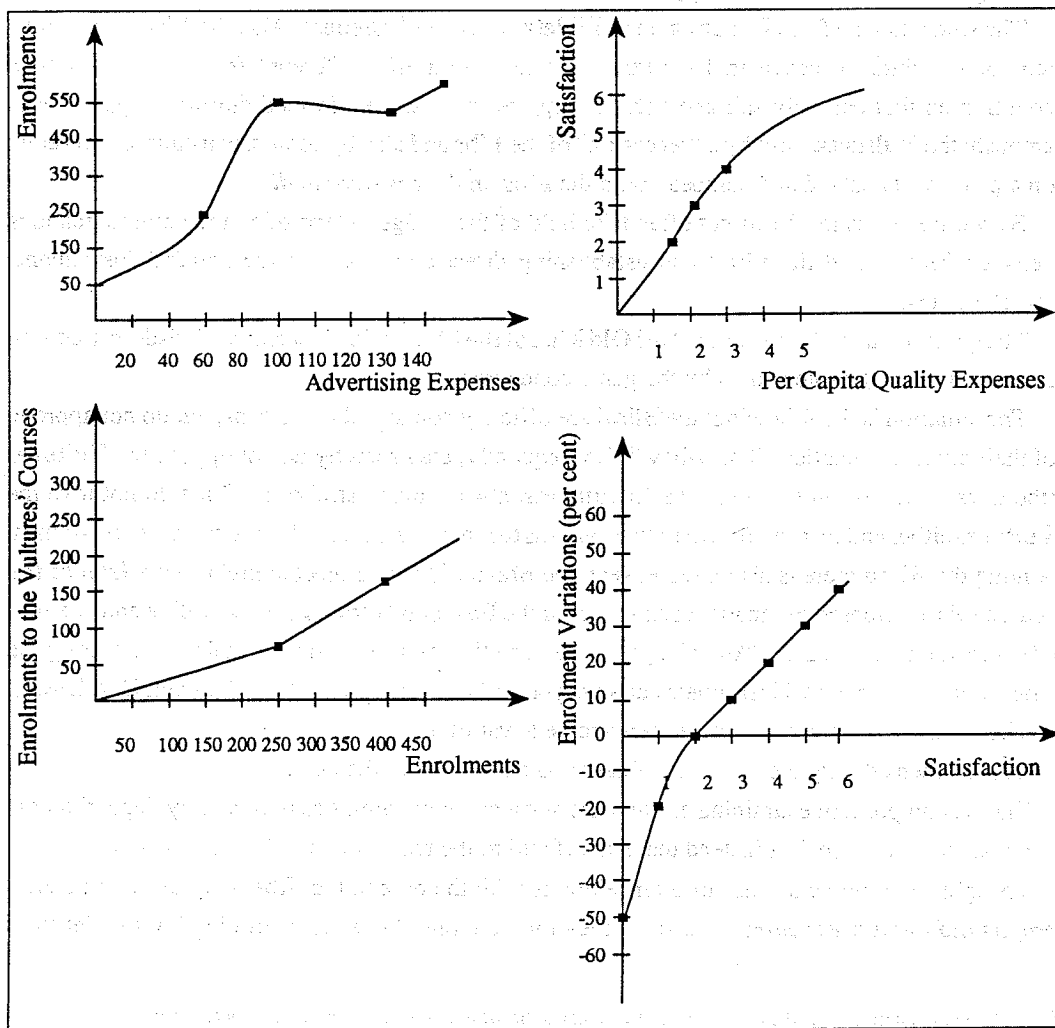
To fight the imminent crisis of their relations with the others, the **Fibs** may decide to start a *propaganda and press campaign*, since they own the only **Federation** printing house. Yet their

6. In Italian the acronym of the three communities forms the word *Folli* which in English means *Fools*.

proposals have to be based on a *feasibility study* (to be requested to an external agency controlled by the **Blind**); they also have to establish a compromise with the **Vultures** (who control the island's area where the paper warehouses are), fight back the disinformation and sabotage of the clandestine **Mermaids** and "enlist" the **Listeners** present on the island.

The **Lucumians** want to renegotiate the ship charter with the **Blind**, to try and fish beyond the poor inland sea (so they need competence, compasses and nautical instruments), to renegotiate the training methods of their "skippers" in the *Sea Polytechnic* (now the **Fibs** no longer possess knowledge exclusively), finally to gain power and influence in the Federation. The **Blind** want to keep and increase their economic power, but to escape the catastrophe they have to "mediate" among the various forces and to reach a new agreement with all the others. The **Listeners** want greater autonomy and, if possible, to be recognized as an independent nation. The **Mermaids** fight against every innovation.

The data are summarized in the following charts:



2.3 What happened

During the game session mentioned above, after the division of the players (about 40 among the three communities) and the handing out of the instructions and the funds, the game began: the three communities met separately to decide on their "constitutional" structure and on a treaty to be examined by the others; then a plenary meeting was held.

The treasurer appointed by the **Blind** decided to run away with the money and to seek refuge at the **Lucumians**; meanwhile the **Vultures** occupied part of the **Island of Fiblets**: the crisis had reached its zenith: the **Blind** reacted by blocking all the **Federation**; one of them, however, ran away and joined the **Vultures**. Chased and caught by the **Navarch of the Blind**, they formed an alliance and, conquered **The Islet of the Mermaids**, devoting themselves to piracy. Other unforeseen events followed: three **Fibs** tried to escape towards **Lucumia**, but only one succeeded while the others were caught and imprisoned; freed during the night by a stranger, they took refuge in the area occupied by the **Vultures**; in the meantime the **Blind** moved against the two "pirates".

Given this all against all war, a peace conference was suggested and accepted.

The conference ended with a treaty which allowed the renewal of economic activities and the reconstruction, on new grounds, of the states.

At the end of the second day everything seemed right again!

A seaquake, however, destroyed the archipelago (to somebody caused by the wrath of the **Bearded Goddess**): the harbours of **The Island of Fiblets** were destroyed, but a new island (**New Island**) had emerged with natural harbours; the **Mermaids** foresaw new catastrophes and everybody started to chase the "fundamentalist" group, accused of sabotage.

A new crisis blocked the economic activities: a new peace conference became necessary; it established more accurate rules for the archipelago; the various communities tend to melt and to give rise to another economic development.

The scroll summarizes the main facts and "documents".

2.4 The interpretation

But what did the simulation hide? At a first level, the following interpretation was suggested:

Lucumians: Workers enlisted in the Trade Unions

Fibs: T.U. trainers

Vultures: Private Training Agencies

Blind: Trade Unions

Mermaids: Conservative Union components

while the **Bearded Goddess** was the old "class war" ideology.

This was the interpretation suggested by the game designers. Yet the participants offered many others; among which the most convincing associated the **Lucumians** to workers, the **Blind** to capitalists, the **Fibs** to "state" intellectuals, the **Vultures** to "market" intellectuals, the **Mermaids** to religion.

Resolution 1

1. The Assembly orders to remove the embargo for next year;
2. The Assembly recognizes the Community of the Vultures;
3. The Assembly sets up a Common Bank;
4. The Bank is assigned the following funds:
682 Kilosequins from the Community of Lucumia, in joint management with the communities of Lucumia and the Blind, according to rules to be communicated to the Bank.
5. The Bank will see that all the six warships are turned into fishing ships and become its property;
6. The conversion cost is undertaken by the Bank;
7. The charter profit of the fishing ships, formerly warships, is due to the former ship owners.
8. The total necessary funds are formed by the above mentioned plus 200 sequins from each community. To convert the ships there are 1682 Ks in all.
9. The management of the Bank is controlled by a vote for each member plus three votes to be divided between Lucumia and the Blind.
10. The costs of ship charters, harbour rents and courses are under free bargaining.
11. Experts and scientists are welcomed to make proposals for the improvement of fishing and rural production technologies.
The respective plans will be printed and distributed.
12. The Supreme Court over disputes is set up and may decide on every conflict. The Glorious Community recognizes the problem of refunding the Community of the Fiblets the damages due to its occupation; the matter will be settled by the Supreme Court over disputes.

Resolution 2

1. The Assembly recognizes the enforcement of Resolution 1.
2. It takes cognizance of the joined report made by the scientists of Fiblets and Vultures on the causes and their consequences.
The Assembly also recognizes the absolute necessity of the nautical licence to sail safely everywhere, except in the inland sea.
3. Consequently, each community undertakes to include in its constitution the following rules:
 - It is forbidden to charter ships and crews not having nautical licences issued by the proper authorities (except for the inland sea).
 - Whoever does not possess a nautical licence is not considered a qualified navigator.
4. After what happened, to avoid blocking the economy of the Federation of the Fools, it is of paramount importance to open a new harbour in the emerged New Island.
5. The harbour will be financed by the International Bank and have the direct techno-scientific assistance of the experts and scientists of the Fiblets and the Vultures.
The harbour will give shelter to every ship.
Later on it will be debated the opportunity of building new harbours in other areas of the planet of the Fools.
6. The property and management of the harbour belongs to the Bank which fixes the charters' prices and assigns profits like that:
 - 50% to the Vultures and Fiblets.
 - 50% to the Blind and Lucumians.
7. The Lucumians and the Blind acknowledge with satisfaction the foundation of a single Academy of Sciences by joined decision of the Fiblets and the Vultures.
8. An economic committee is set up to determine the minimum production costs and fix the prices.
9. To meet these and other commitments, the scientific community undertakes to design new agricultural and fishing tools.
10. Every citizen is free to adhere to any religion.
11. Taken account of the existence of religious beliefs in the Federation of the Fools, we invite the supporters of the Bearded Goddess to negotiate the possibility for them to profess their faith freely. The negotiation must not, in any case, interfere with lay matters; each state must under-take to support the new church.

2.5 Aims

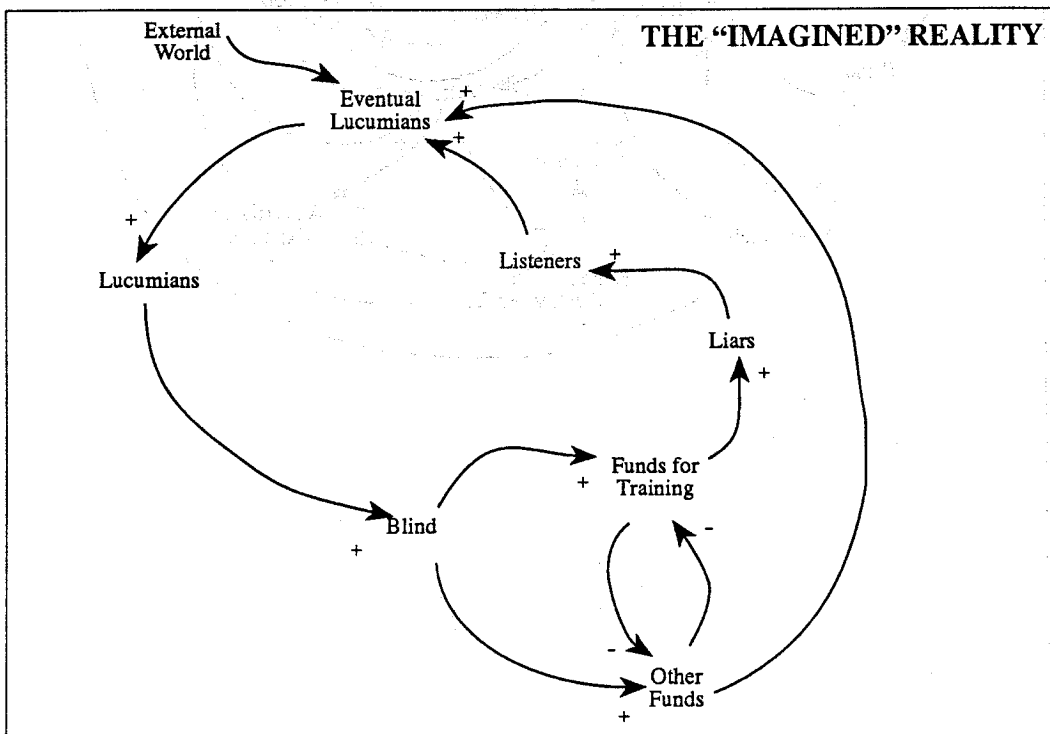
The aim was to learn how to manage conflicts generated by a game which contained also elements, steered by the conductor “disguised” as the **Old Man of the Mountain**, to solve them as well as to “think” about what had happened and form an interpretation model.

Parallel to the role-play, in fact, a course of **Systems Analysis** was being held (the participants had already attended an introductory course) where the aim was to try and “explain” both the game “hidden” structure and dynamics resorting on the language of flow charts and their application in *Dynamo*; the result here presented, though not highly significant in itself, acquires relevant interest if we consider how it was obtained: in “real time”, by “non experts”, on a “not well known situation evolving continuously”.

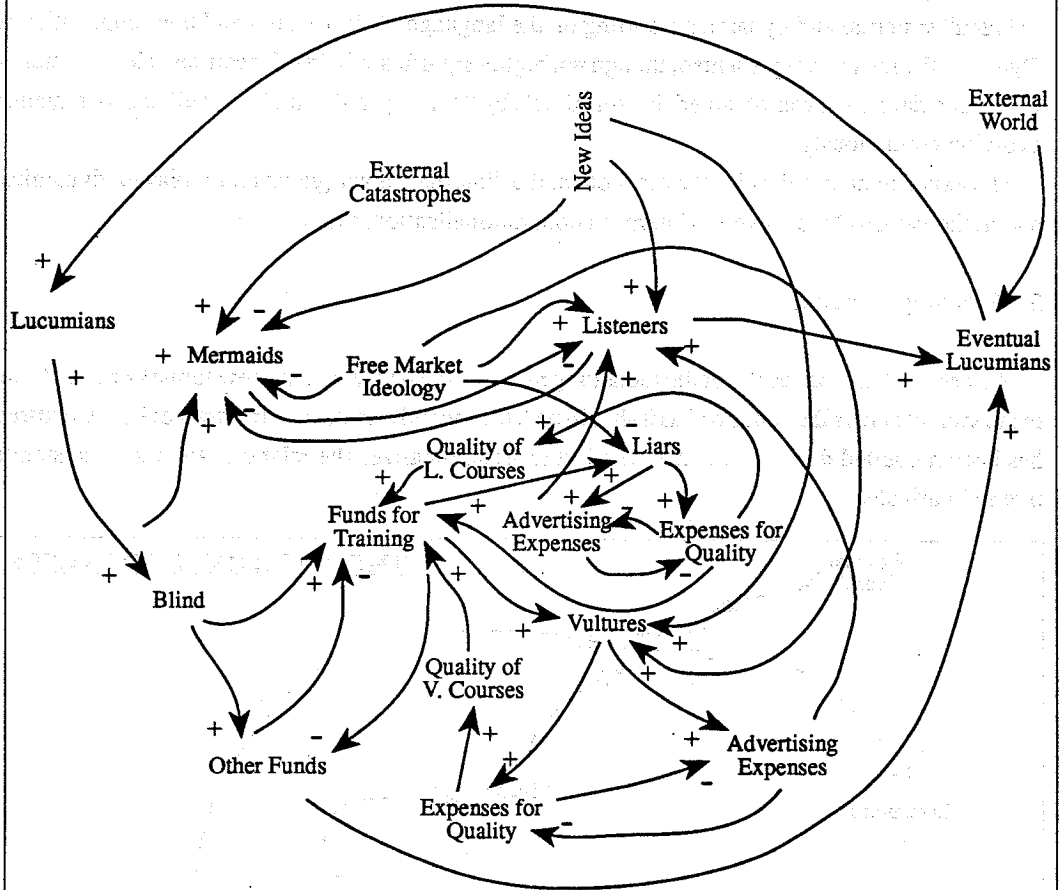
The experiment has thus hit the aim both at the “internal” level (game really played, dynamics) and at the various “metalevels” (interpretation, rationalization, modelling).

3. Modelling Lucumia

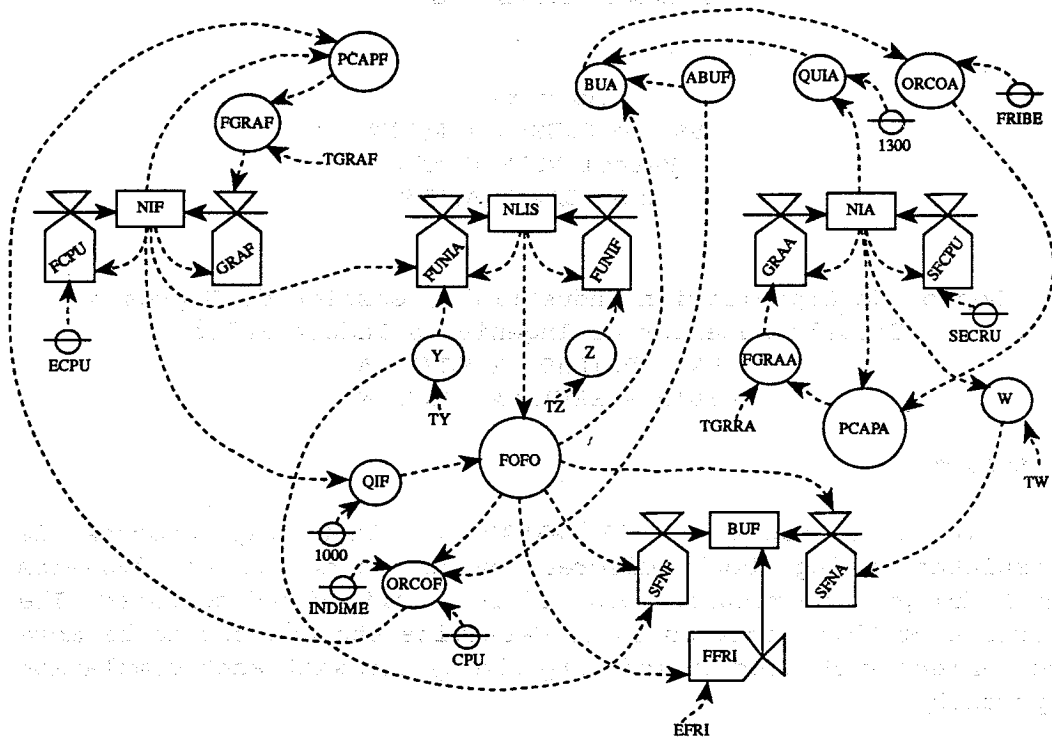
We present here the results of the modelling made by the participants; a few remarks will suffice: the first chart shows the situation “as it should be”; the second is instead a first draft of how **Lucumia** has been modelled during the game. The last chart summarizes the relations among the system’s internal variables.



LUCUMIA AT WORK: SOME RELATIONS



RELATIONS AMONG THE INTERNAL VARIABLES



NLIS	Members of T.U.	FCPU	Function applied to propaganda campaign
FUNIF	New enrolled to T.U. training courses	GRAF	Appreciation of T.U. courses
FUNIA	New enrolled to Private Agencies (P.A.) training courses	FGRAF	Appreciation function of T.U. courses
Y	Function of enrolled to T.U. training courses	PCAPF	Per capita expenses for T.U. courses
Z	Function of enrolled to P.A. training courses	ORCOF	Total expenses for T.U. courses
FOFO	Funds for training	INDME	Expenses for feasibility study (market survey)
ABUF	Training budget from T.U. (basic)	CPU	Expenses for propaganda campaign
BUF	Total training budget from T.U.	BUA	P.A. training budget
SFNF	Function applied to enrolled to T.U. courses	QIA	Contributions from T.U. to P.A. courses
SNFA	Function applied to enrolled to P.A. courses	NIA	Enrolled to P.A. courses
FFRI	Fringe benefits (for T.U.)	SFCPU	Second function applied to propaganda campaign
QIF	Cost of enrolment to T.U. courses	GRAA	Appreciation of P.A. courses
W	Second function of enrolled to T.U. courses	FGRAA	Appreciation function of P.A. courses
NIF	Enrolled to T.U. courses	ORCOA	Expenses for P.A. courses
		FRIBE	Fringe benefits (for P.A.)
		PCAPA	Per capita expenses for P.A. courses