Experts in the hive.

Knowledge and tools for a sustainable urban planning

Arnaldo B. Cecchini cecchini@uniss.it

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Why the hive?

Because more than a node in a network of relationships, more than a node in an entangled network, **the role of the expert** in the planning process is similar to the activity of a beekeeper.

The planning process is not only multidisciplinary (it has to deal with soil and air and water, with flows and stocks, with societies and economies, with infrastructures and behaviors, ..), but it must be systemic.

To convey this idea, we may think of city and its territory as a living system, made of living organisms and their environment, like a hive for instance; in this metaphor the expert or better the planner would be the beekeeper or better an intelligent bee, that is, a bee with a vision, with a design.

A spider conducts operations that resemble those of a weaver, and a bee puts to shame many architects in the construction of her cells. But what distinguishes the worst of architects from the best of bees is this:
the architect raises her structures in imagination before she erects them in reality.

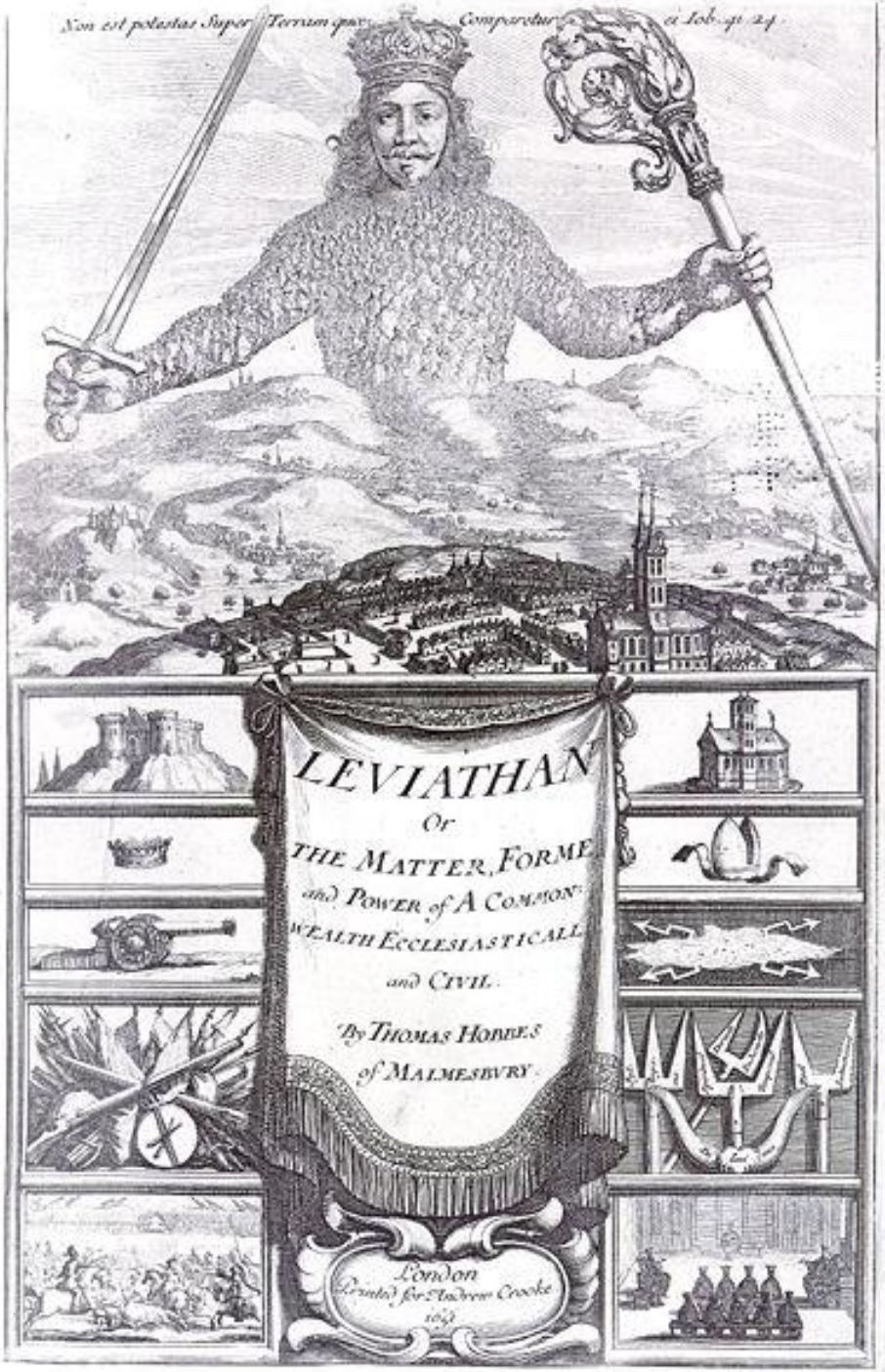
… the two types of scientific knowledge we have distinguished. The *bricoleur* is adept at performing a large number of diverse tasks; but, unlike the engineer, he does not subordinate each of them to the availability of raw materials and tools conceived and procured for the purpose of the project. His universe of instruments is closed and the rules of his game are always to make do with 'whatever is at hand', that is to say with a set of tools and materials which is always finite and is also heterogeneous because what it contains bears no relation to the current project, or indeed to any particular project, but is the contingent result of all the occasions there have been to renew or enrich the stock or to maintain it with the remains of previous constructions or destructions. The set of *bricoleur's* means cannot therefore be defined in terms of a project.

Metaphors, like analogies, like allegories must always be handled with care. They suggest, show, open the mind, have an heuristic function, but we have to block them quite soon.

Architect in the hive, OK. Beekeeper, OK. Bricoleur OK. We may add the plumber with its toolbox (remember: a good plumber adapts himself to what he has *faute de mieux,* but he has a goal, purposes, a project and, when he works at a large scale – maybe he needs a plan).

The same happens when we speak about "urban metabolism": it is a rich metaphor, because we see the city and its territory like a living system, a right and fruitful way to model it. But we must be cautious.

Let's explain better the hive-beekeeper metaphor.

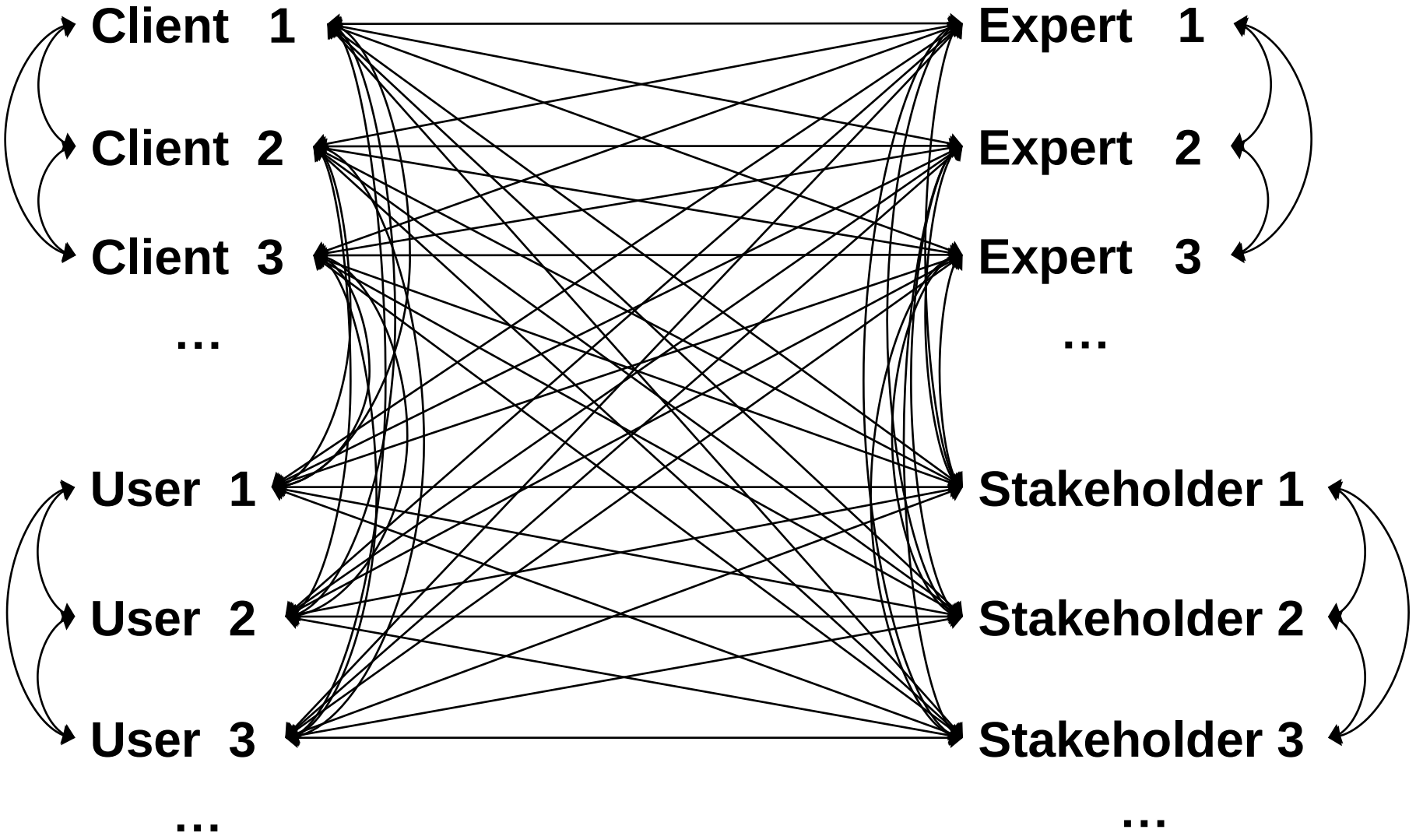


Let’s make a clarification of terminology.

In this presentation we will use the term **stakeholder** in a strict sense (a person or an organisation with an interest or concern in something), which is other than a **client** (a person or an organisation using the services of experts) or a **user** (a person who uses or operates something).

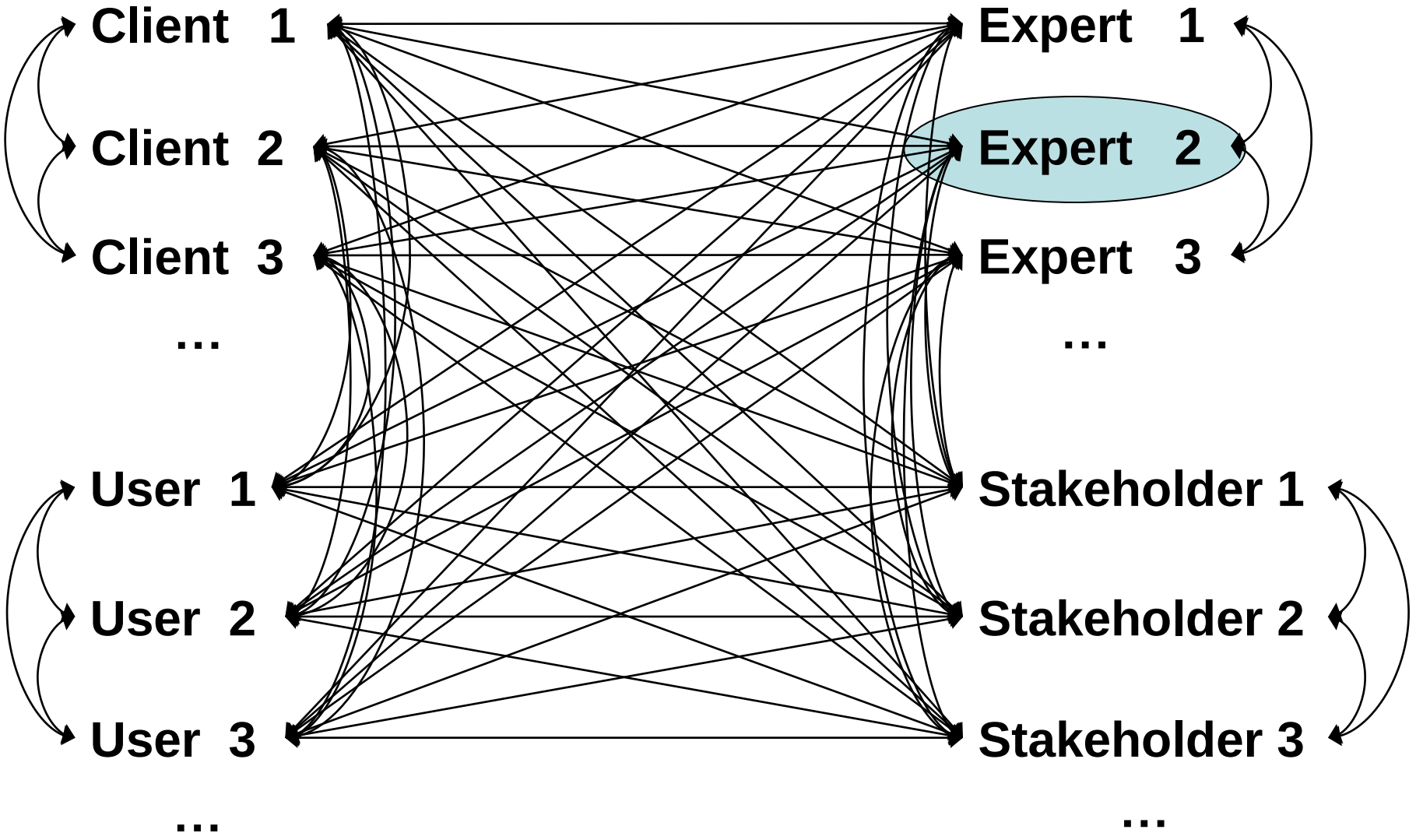
For instance, an interest or a concern could be financial: a capital equity has an interest in an airport, different from the interest of the Regional Authority – let’s call it the **client** – which commissioned the plan of mobility and accessibility to the **experts**, or from an environmentalist Association with concerns different from those of a potential passenger of the new airport – let’s call passenger the **user**; both, environmental association and capital equity are **stakholders** in our sense.

Of course, a member of the Regional Authority could at the same time be a potential passenger as well as a member of the environmentalist Association, but the distinction does make sense.



Hidden stakeholder 1 Hidden s. 2 Hidden s. 3 …

Illegal stakeholder 1 Illegal s. 2 Illegal s. 3 …



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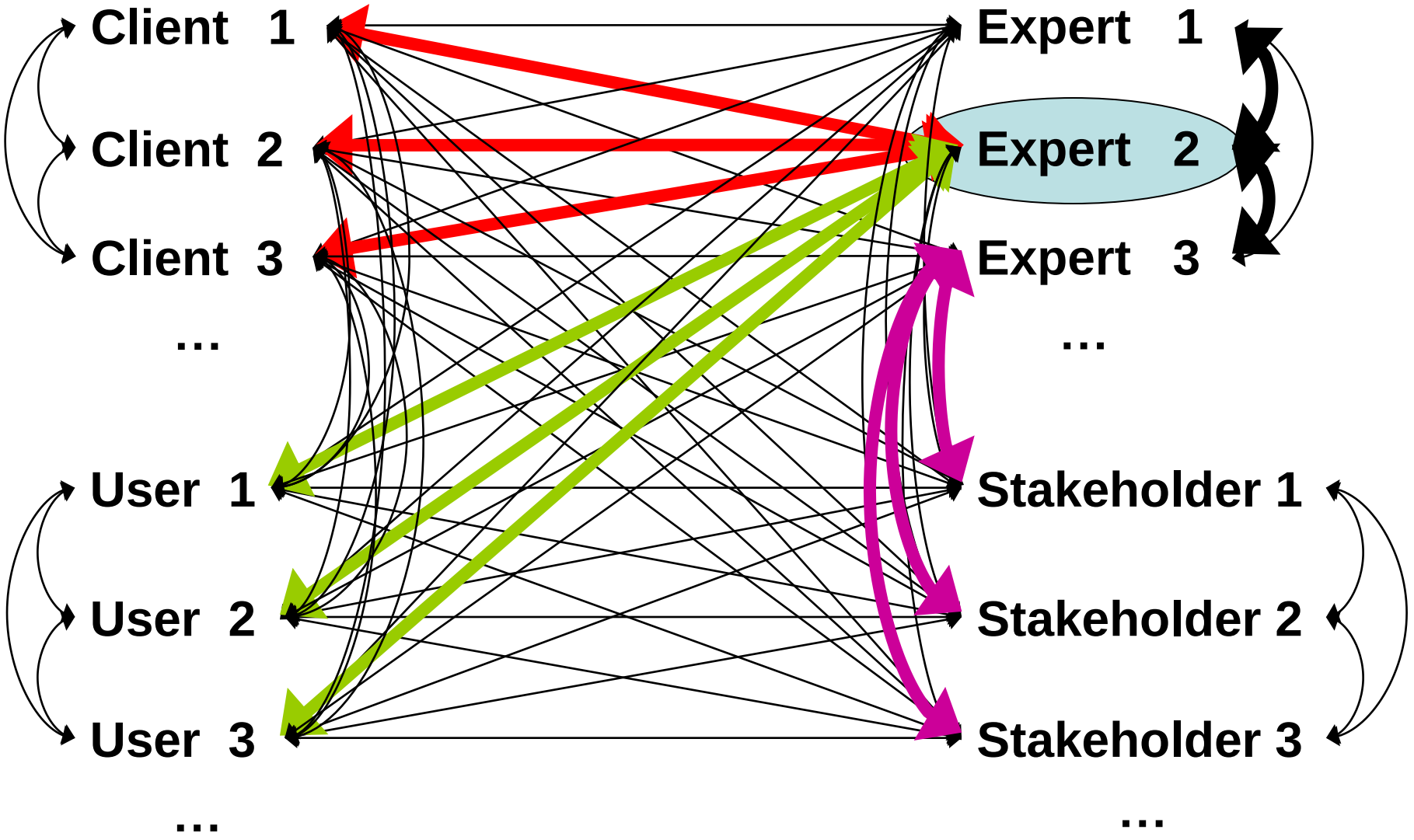

Hidden stakeholder 1 Hidden s. 2 Hidden s. 3 …

Illegal stakeholder 1 Illegal s. 2 Illegal s. 3 …

We need modular models; models that are:
friendly, usable and understandable by the protagonists of the planning process (never use *black boxes* if not strictly necessary);
flexible, adaptable to different circumstances and to different phases of the planning process;
multi-level, usable and useful at different levels of complexity and mutually interoperable;
inexpensive, should be of common use, used when needed, and should cost just a modest fraction of the total cost of the planning activity;
Interconnected with the communication tools of any kind (or better, of the “right” kind for each particular objective and for each particular groups of actors).

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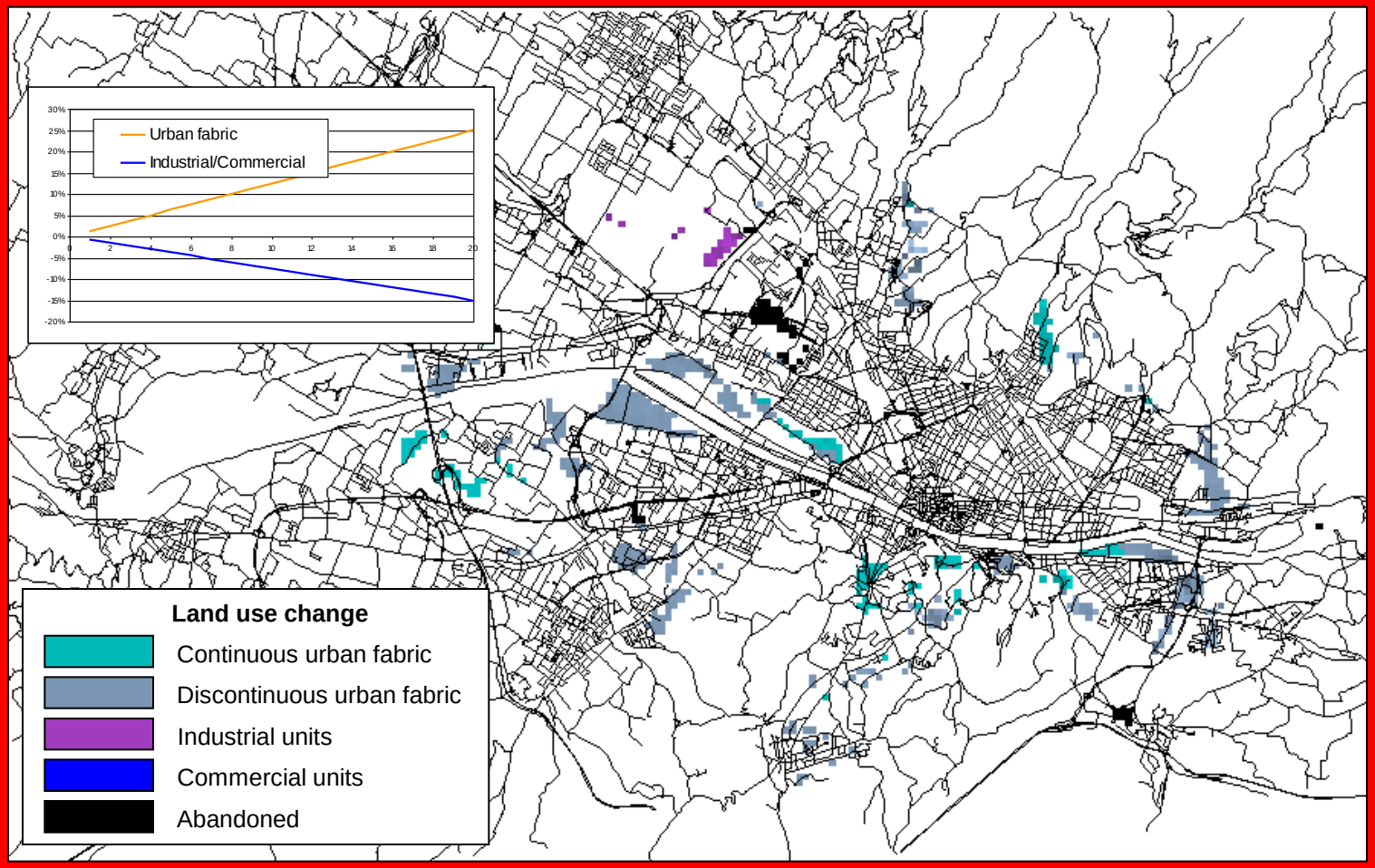
This kind of models and tools could be used in the black, red, blue and violet line of our scheme, and we will show briefly how.

The general structure could be thought as a multifaceted DSS, let's call it a **DSS Environment**.

To talk with other experts, the DSS environment provides a “space” able to organise the workflow, to allow brainstorming and building of cognitive maps, to trace the discussions, to compare the meanings of the words, to exchange data and information, to build common data sets.

To talk with clients, the DSS environment provides the cockpit for testing alternatives and simulate scenarios, sets of tools for monitoring and evaluating systems.



To talk with users, the DSS environment provides forums and tools for discussion and collection ideas and proposals, a system for surveys and a set of communication tools; moreover accessibility to databases and GISs.

To talk with stakeholders, the DSS environment provides a “meeting space” and a “wall of proposals”, together with the access to the output of scenarios and simulations.

Such models should serve for:

deliberation, make the decision-making process transparent, motivated and responsible;

negotiation, allowing the confrontation among different points of view and eventually serving the purpose of composition of interests;

consensus building, favoring informed and aware consensus around decisions taken by the public decision-maker;

evaluation, allowing the verification of the outcomes of the decisions and the *in itinere* correction of ineffective and contradictory actions.

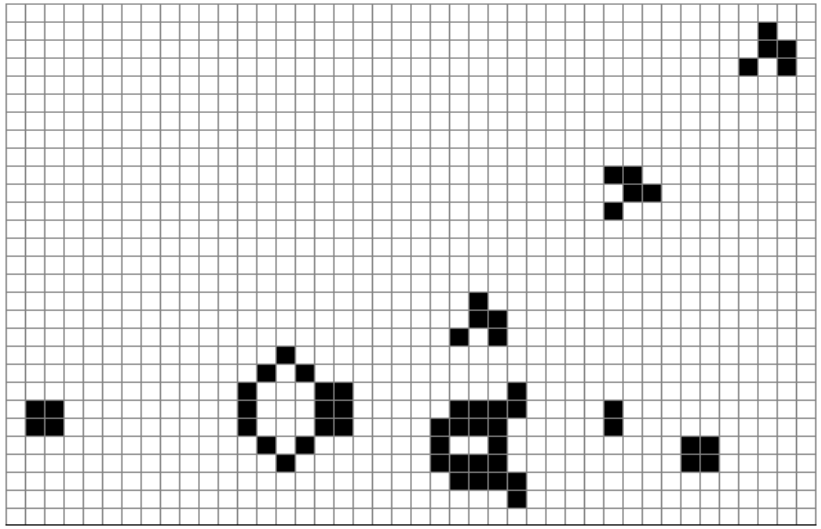
These models should reach their aims as part of more sophisticated models, when necessary.

Back to metaphors and beyond– Concluding remarks

The paradigm of the artificial life, both in a Darwinian and Lamarckian (memetic) approach is a good way to deal with the future of city.

This future will be shaped by both *bottom-up* and *top-down* phenomena, it will be at the same time free and constrained, allowing choice, but accepting necessity.

But if we want possible futures also be desired futures, we need a plan and a purposeful vision, a plan anchored to the living processes of the living organism that is the city, to its metabolism.



Back to metaphors and beyond– Concluding remarks

Modern ships are not “governed” (“to govern” comes from the Greek *kubernesis:* leading a ship) in the same way the ancient ships were.

But we still deal with waves, winds, rocks, shallows, storms.

So we need different plans, plans of new generation, but we still deal with rent and land uses, we need rules and constraints, we need incentives and projects; we have to know the role of actors, their interest and their availability, we need actions coherent with a vision, but adaptable, we need public participation: as the helmsman (the last metaphor!) - the *kubernetes* - we can conduct the ship only by knowing the natural driving forces, but we also need to know where we want to go and possess appropriate knowledge and tools.

In this sense, sustainability must mean more than a mere general reference to a key-concept. We must assume, also in small decisions, the perception of the limits, the simple fact that every action is not only a contribution to the total, but that it interacts with other actions at different level, also at symbolic ones. This means that the awareness is the preamble to any decision.

For these reasons a DSS environment *could* be a basis for a sustainable planning.

Freedom, in this sphere, can only consist in this, that socialized men, the associated producers, govern the **human metabolism** with nature in a rational way, bringing it under their collective control instead of being dominated by it as a blind power; and in accomplishing this with the least expenditure of energy and in conditions most worthy and appropriate with their human nature.
This of course still remains within the realm of necessity.
The true realm of freedom, the development of human powers as an end in itself, begins beyond it, though it can only flourish with the realm of necessity as its grounding.

Fig-1

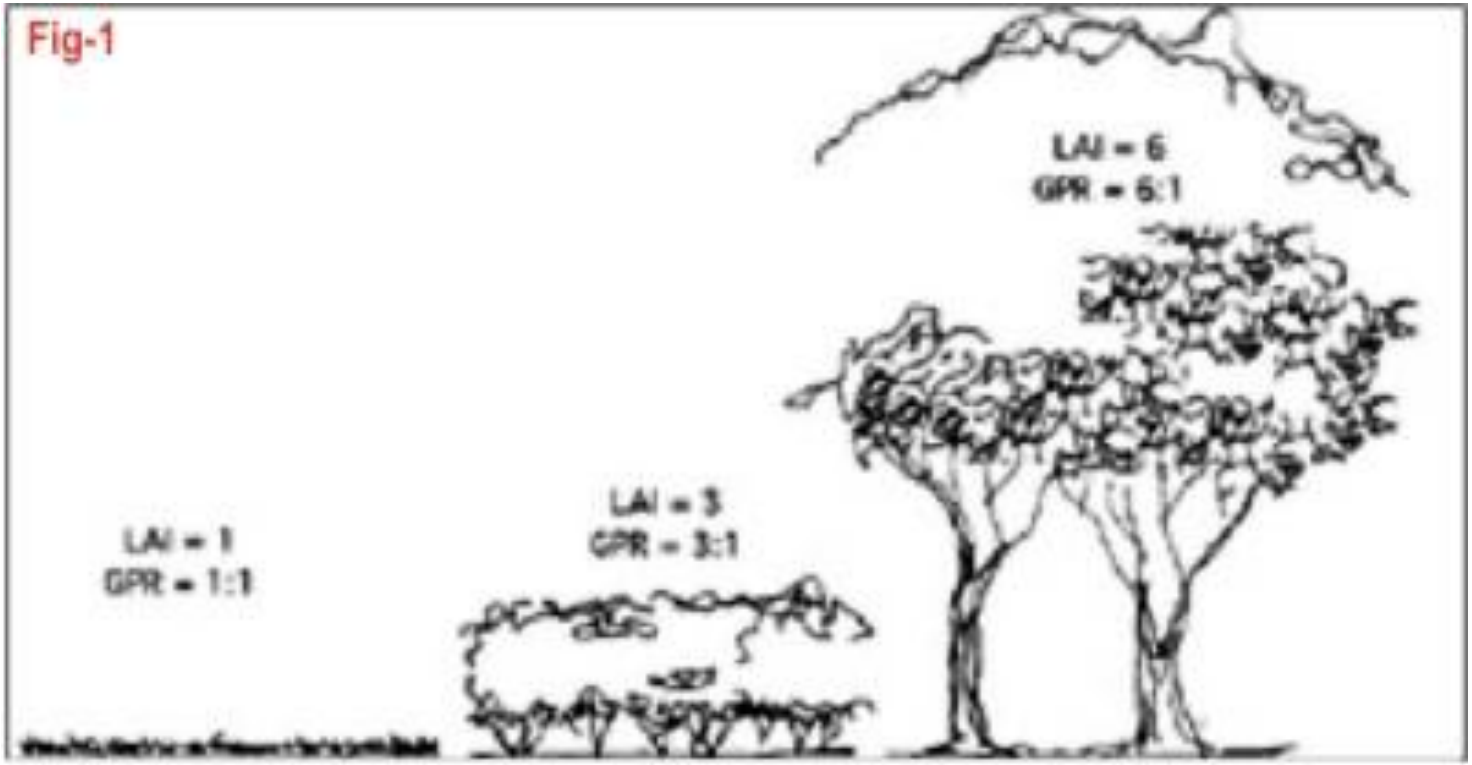

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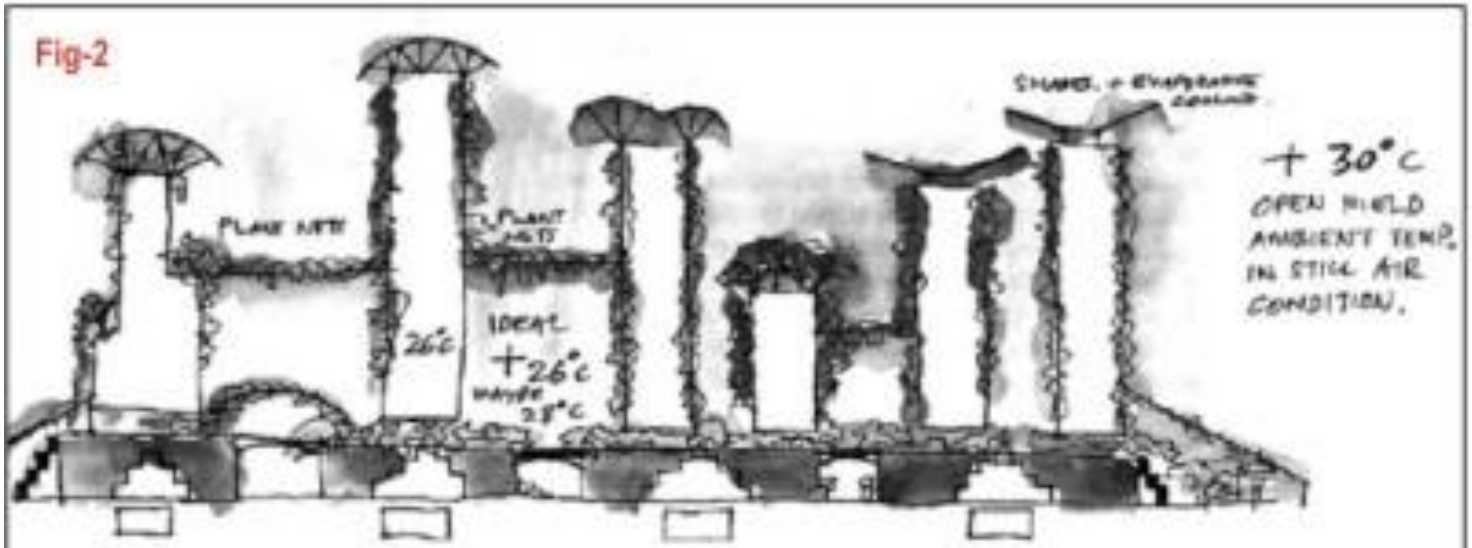
Fig-2


+ 30°c
OPEN FIELD AMBIENT TEMP. IN STILL AIR CONDITION.
IDEAL
+26°c
26°c
THE IDEAL IS TO REPLICATE THE TROPICAL FOREST CANOPTION.