

MIDDAY IN ATHENS

A SOCRATIC DIALOGUE ABOUT SYSTEMS

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Abstract

The paper includes the first “day” of a wider dialogue “à la Plato” about systems, under a System Dynamics perspective. Socrates, discussing in the Agora with a young ante litteram manager, practices the art of maieutics in order to elicit and clarify the basic concepts about systems.

DAY ONE

SAPYLOS: Hello, Socrates, dear friend: just the person I was hoping for! What about spending a couple of hours here in the Agora with us, having a talk just like old times?

SOCRATES: Welcome back, beautiful and wise Sapylos! How long since we met last time in Athens! It will be a great pleasure; but, first, who is the young man coming along with you today?

SAPYLOS: I apologize, Socrates: let me introduce you the excellent Magliones, my ambitious friend!

SOCRATES: (*suspiciously*) Ambitious ...?

SAPYLOS: Do not worry, Socrates, I am not here to bring you a new Alcibiades. Our dear Magliones is not a politician, but, rather, an outstanding Manager.

SOCRATES: A Manager, you say? Forgive my old man’s memory, Sapylos. Badalòcritos, I believe, must have mentioned this term no later than a couple of days ago, but I just can’t retain these sorts of barbarisms...

SAPYLOS: Let me try to elucidate the concept in a few words. We might define a Manager as anyone who tries to bridge the gap between the Ideas and the sensible world, gathering up resources from different origins and turning them into *Kosmos* by virtue of his order-oriented action.

SOCRATES: At last, my dear, I understand what you mean. You know, I was just discussing it some days ago with Timaeus. Why, however, using such a neologism, so harsh and alien, when our language owns a noble word to express this same concept: “Demiurge” ...

SAPYLOS: Don’t make fun of me, Socrates. Nothing to do with the “hyperuranion”; rather, I refer to

persons who organize activities involving people, materials, tools and money in order to achieve a set of goals. It is a profession, Socrates; furthermore, a highly regarded, and very well paid one.

SOCRATES: Very interesting, really. But tell me, Sapylos, so that I can understand it better. If the potter's business is making pots, and the butcher's business is selling parts of animals to foreigners and craftsmen, and....

SAPYLOS: Stop it, Socrates, by Zeus! Please do not start over again like last summer at Euthydemus': I know where you are leading us, but today I'm not in the mood for coping with this kind of puzzles. Luckily, we have with us the one who can argue better than anyone else in such a discussion. Although, Magliones, to be honest, I only could monitor closely your career as long as you were working in the Olive business. But nowadays your job looks much more complex. So tell us, my beloved, what the hell Managers do?

MÀGLIONES: With great pleasure, Sapylos, I will answer. But, rather than quibbling about Management 'in itself', let me tell you my own story. As you may know, years ago the noble Telecomacos took over a shop where a dozen slaves produced pots on demand. Over time, as the slaves became more and more clever, and the pots more attractive, he decided to try manufacturing some extra products to be sent to the market place. And, since people liked that pottery, and even queued up for hours to purchase it – to be honest, there were not many other similar shops in town – he gradually hired professional craftsmen, and engaged merchants to bring their products to more far away markets. At some point the business became so complex that Telecomacos, well aware that it is not worthy of a noble man neglecting philosophy and gymnasium for such kind of mercenary activities, entrusted me with the great responsibility of organizing and running the business, enjoying maximum autonomy, and appropriate awards, against a set of targets I was committed to reach.

SOCRATES: A position of responsibility, Magliones. But tell us, how do you organize your work?

MÀGLIONES: First of all, Socrates, it is my duty to understand how things work, and particularly what are the causes leading to troubles or success; since, after all, what would be the point of hiring a manager if people already knew those causes, so that they can govern things by themselves?

SOCRATES: A praiseworthy intention, Magliones. Cause, even though it isn't sufficient to act well, we can agree that, without such a knowledge, no good action will be possible. Don't you think so, Sapylos?

SAPYLOS: (*caustic*) I have a point to make concerning it. Never heard of the "L" factor?

MÀGLIONES: Let it fly, Socrates, Sapylos is a provocateur. "L" stands for "Luck": a statement of sound optimism about the effectiveness of human skills. Rather, I have to agree with you, Socrates. We should even say that the capability to see clearly causes and effects is the first and foremost virtue for a Manager.

SOCRATES: So, Magliones, how do you exercise such a virtue? Let's suppose for example that recently your pots have not been finding as many buyers as in past years; that in fact your craftsmen arrive at work late in the morning, quarreling and producing highly defective pottery, and...

MÀGLIONES: You're telling me! This *is* just what is currently happening to our organization, Socrates. Zeus is my witness; I'm diverting hours and hours from the liberal arts to investigate why this is happening. But, happily, the art of Management helps me in thoroughly analyzing the current state of business. When you think about any problem, my dear, you should always look for what we experts call Critical Success Factors: those elements, I mean, that *cause* success in your enterprise, when properly managed, and malfunctions otherwise. Let me give you an example of how a Manager works. We attested we need first of all to explain why our business performs poorly, didn't we?

SOCRATES: Undoubtedly, Magliones.

MÀGLIONES: Well, if you hand me that papyrus and a quill, I'll show you how. To begin with, let's give a name to our problem – “**Poor Performance**”, for example– and let's write it down somewhere on the right side of the papyrus.

SOCRATES: High technology, Magliones...

MÀGLIONES: This is only the start, Socrates. Let's go on step by step. “**Poor Performance**” is the effect we want to explain, whose causes we are looking for. Now, we all know that many men in our world are filled of envy and jealousy, or emulation at least. So it happened that, spurred by Telecomacos' success, other noblemen started to invest their money in manufacturing pottery – what's more, a lot of money indeed. Month after month, at the market new stalls sprout up selling pottery like ours. To be honest, not exactly like ours: indeed, some of the jars were quite different and somehow fashionable in terms of shapes and colors, while others traded harmony and decoration off against much lower prices. Many customers accordingly started buying the new pottery. Do you agree that this may have been a cause of our troubles?

SOCRATES: I agree, Magliones.

MÀGLIONES: So, let's catch the idea writing down the term “**Competition**” on the left side of our papyrus, in order to distinguish what is a cause and what is caused by. Then, for better understanding, I will draw an arrow from “**Competition**” and to “**Poor Performance**” (Figure 1); with the tip pointing to the latter, meaning that “**Competition**” is causing “**Poor Performance**”. Do you follow me?

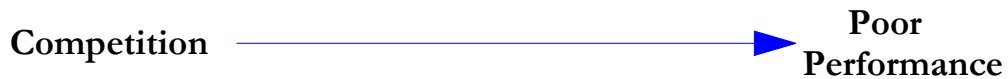


Figure 1

SOCRATES: Since Zeno of Elea introduced them within one of his paradoxes, arrows never had a good reputation in philosophy; but maybe in Management Sciences they will enjoy better luck... I follow you, my dear, and it seems to me a very straightforward way indeed to represent and explain facts.

MÀGLIONES: And that's not all, Socrates. Blaming the others is easy and worthless, whereas I always valued your golden precept, “know thyself”. So I applied the principle to our own organization, investigating in depth its behavior. What’s more, I started examining those very people who coordinate actions and make decisions, our Managers. Since, as you can easily understand, I had to set up a whole hierarchy of Managers to run an organization like ours.

SOCRATES: That’s not so hard to believe, Magliones.

MÀGLIONES: Well, a set of face-to-face interviews revealed on a closer inspection an doubtless poor quality in their managerial performance. No doubt, a direct effect is worsening the overall performance in our organization; a second concept to pin down on the left side of our papyrus.

SOCRATES: With the arrow going from “**Poor management quality**” to “**Poor Performance**” ... (Figure 2)

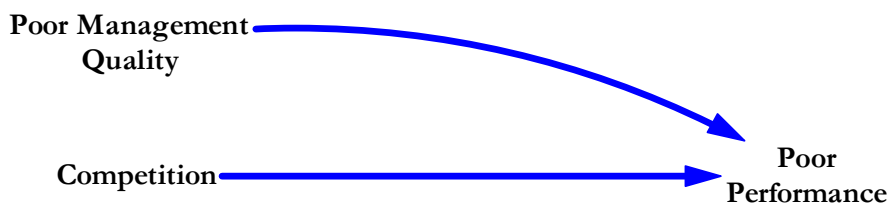


Figure 2

MÀGLIONES: Right, Socrates, it seems you are getting straight into the method. But my investigation about our Managers does not end here. You are certainly aware that, in an enterprise like ours, definitely the craftsmen cannot work separately. In order to manufacture pottery swiftly and smoothly, some artisans are given the responsibility to prepare the clay, others mould it into different shapes,

others paint the pot. Skilled craftsmen bake the artifacts in ovens that specialized slaves keep at the right level of heat. Then there are merchants, carriers, inspectors controlling that the jars are not fissured, people managing the money you collect and keeping accounts with their abacus... In short, a lot of people having to work together in harmony and in sync.

SOCRATES: Like those machines you can find sometimes at the theater, where a lot of levers and crank mechanisms must work in sync to throw the actor playing the god into the middle of the stage?

MÀGLIONES: Exactly. Unfortunately, in our organization, nothing remains of this wonderful harmony. With an unavoidable strong impact on our enterprise's performance. Cold comfort: we got at least another fundamental contribute to our analysis, and a third item ("**Lack of coordination and teamwork**") to be placed on the left side of our scheme (Figure 3).

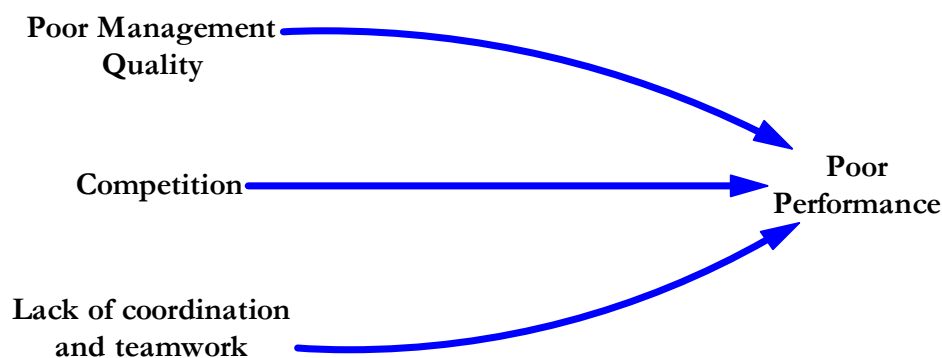


Figure 3

Actually, on closer inspection, I discovered that people do not talk to each other as they should. Our merchants rarely report to craftsmen what kind of pottery people at the market ask for; the clay mixers forget to warn of any shortage in materials that can block the operation of the whole chain; three potters shape three handles for the same pitcher because they have not been coordinated... How can we achieve good results this way?

SOCRATES: I really don't know, Magliones.

MÀGLIONES: So here is our fourth leading cause: "**Poor communication**" (Figure 4).

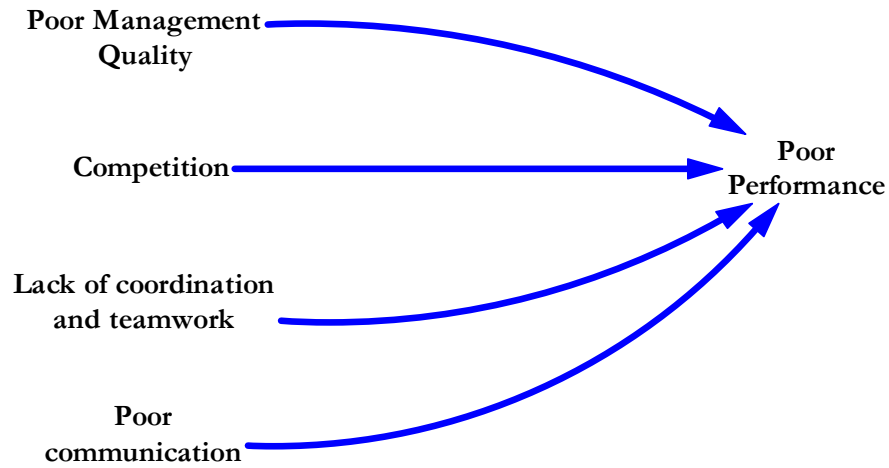


Figure 4

But still that is not all. After our Managers, I checked the quality of the people that physically carry out our pottery, the artisans.

SOCRATES: So what?

MÀGLIONES: Well, it seems nowadays our shop hosts only scraps. Good craftsmen are immediately hired by our competitors, who offer higher salaries, and each month some of our best artisans leave us to go working in another shop. To replace them, we have to recruit young apprentices, but they have virtually everything to learn about their work: so they produce less and make a lot of mistakes, not to mention the hours our craftsmen have to waste to teach them. As a result, our production decreases, the quality of our pottery worsens, and a lot of faulty jars reach the market (Figure 5).

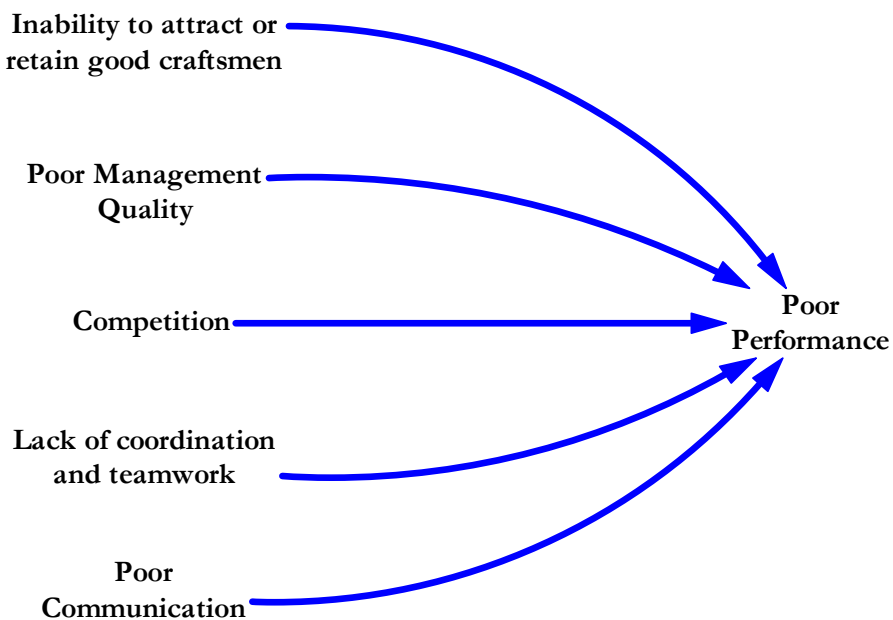


Figure 5

SOCRATES: And this is the fifth cause, I presume: “**Inability to attract or retain good craftsmen**”. Just now exceeded in number the elements that Empedocles from Sicily involves in explaining the whole Kosmos. At least, is the list complete?

MÀGLIONES: If it only was true! How will we forget the Economy?

SOCRATES: Economy? My dear Magliones, what have houses to do with your business now?

MÀGLIONES: Do not take everything I say verbatim, Socrates: we all must update our lexicon, the world is changing fast. Today Economy does not mean anymore, like for the ancients, the art of well running our houses, but rather the overall behavior of households, businesses and government, seen as a whole. And we know that recently Economy is low, pushing our customers to restrict their purchases. Can you follow me?

SOCRATES: With some difficulty, Magliones. People, with their own needs, desires and beliefs, spend money, work, and govern. Do we really need such an abstract concept to explain their actions? However, let’s go on: if necessary, we will come back later to this topic.

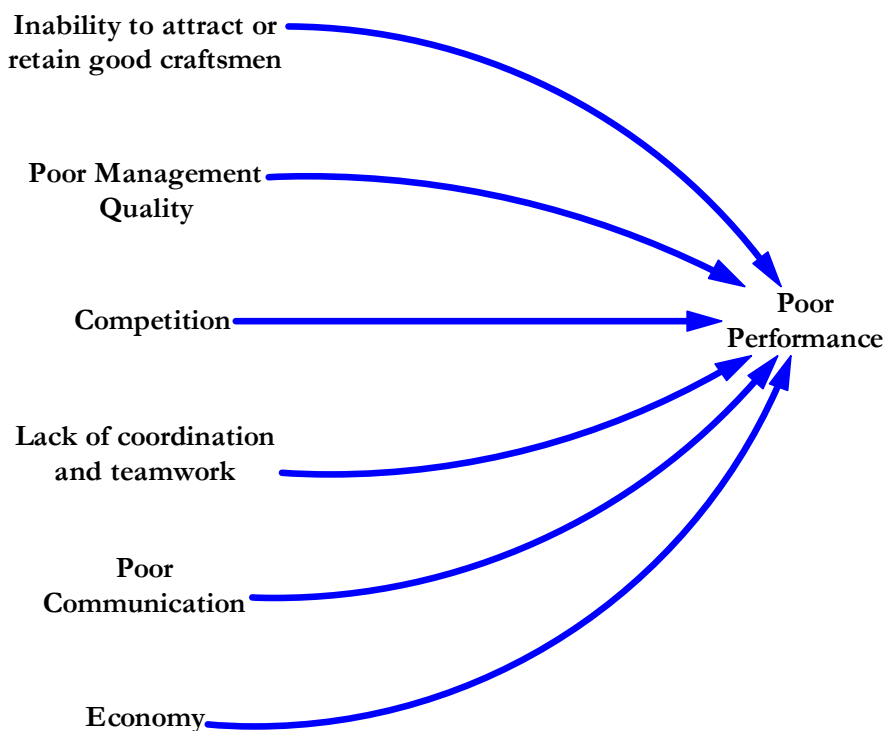


Figure 6

MÀGLIONES: In fact, adding Economy to our scheme we completed the causal structure of our problem (Figure 6). To be more precise, we should now assign a weight to each cause, to account for how much each item contributes to the problem. For example, I estimated that “**Competition**” acts according to one part out of three in generating poor performance. And “**Poor Communication**” for seven-eighths, so that, using the famous Egyptian rule, in which subtracting two parts out of three from the difference between...

SOCRATES: By the gods, Magliones, spare me these calculations: I’m sure you’re definitely more skilled than me in handling them.

MÀGLIONES: As you wish, Socrates. In short, this way the causal structure of the problem is fully understood. In order to improve the enterprise’s results, we will just have to act on the causes (on the left side), so that each of them, in proportion to its weight, will impact the effect, our performance. Simple and precise. Not to mention the sober elegance of its representation, look at the picture...

SOCRATES: No doubt about it, Magliones: simple, precise and elegant. But let me sum it up, so that I will be sure I have correctly understood. You divided the papyrus into two columns: on the left you listed the causes, and the causes *only*, correct?

MÀGLIONES: That’s right, Socrates.

SOCRATES: While on the right side you wrote down the effects of those causes, connecting them through arrows to get rid of any doubt or ambiguity. Because causality has to run in one single direction: as fire causes a burn, while a burn does not cause fire.

MÀGLIONES: Definitely.

SOCRATES: And as fire comes in time before the burn, the items on the left precede the right ones, I presume.

MÀGLIONES: Exactly.

SOCRATES: So, sharply separating causes from effects, you can act on the former to change the latter.

MÀGLIONES: You took the words right out of my mouth.

SOCRATES: Well then, Magliones, you know I am not a practical man, and I know virtually nothing about pots and potters. But, for the sake of argument, let me ask you some questions.

MÀGLIONE (*slightly annoyed*): Sure.

SOCRATES: So, let’s suppose that in your organization things are not going so well; or, as you say,

that its performance has been poor. And that maybe this condition has been going on for months or years. Can we expect that, in such a condition, your Managers will keep on working with confidence, deciding and organizing peacefully?

MÀGLIONES: No, indeed.

SOCRATES: And can we even imagine that often they will decide not according to reason, but rather compelled by the fear that things will get even worse; and that sometimes they will be more busy looking for another - less risky - job than managing their own tasks?

MÀGLIONES: Yes, we can. I've witnessed similar behavior myself on several occasions.

SOCRATES: And, if we acknowledge it, we should conclude that “**Poor Performance**” has some effect on “**Management Quality**”: am I wrong?

MÀGLIONE (*biting his lip*): Well, in a sense ...

SOCRATES: So, Magliones, according to your brilliant method, we should now draw another arrow: but this time starting from “**Poor Performance**” back to “**Poor management Quality**” ... (Figure 7)

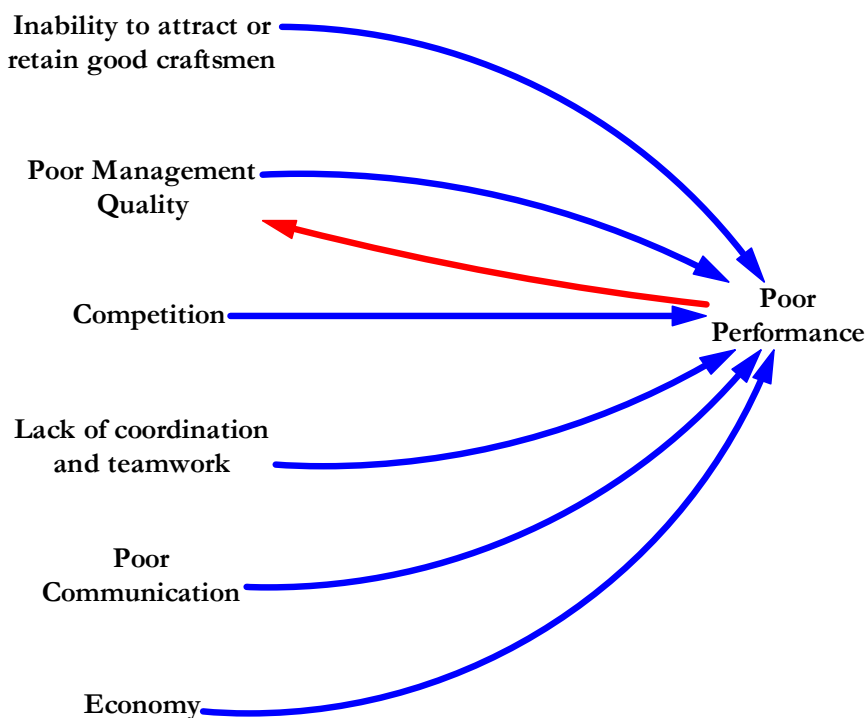


Figure 7

MÀGLIONES: So the method says, Socrates.

SOCRATES: But we stated that causes precede effects in time, didn't we? Is “**Poor Management Quality**” a cause or an effect of “**Poor performance**”? It reminds me of an old story, about eggs and chickens ...

MÀGLIONES: (*defensively*) I don't know what to say, Socrates, I have never been in this kind of trouble using my method ...

SOCRATES: Let's keep applying it diligently. Expert craftsmen leaving your shop: that, you said, is one of the reasons for poor performance in your business, and I agreed. My question now is: why did it happen?

MÀGLIONES: (*a little annoyed*) I already tried to explain it to you, Socrates. When the new competitors arrived, they needed several expert craftsmen for their shops; so they offered our artisans lots of money to work for them.

SOCRATES: Why didn't you offer them more money to stay?

MÀGLIONES: At the beginning it was a matter of principle. I didn't like supporting greed among our artisans. But later...

SOCRATES: Later?

MÀGLIONES: Well, Socrates, simply our shop's performance had started to decline and, even if we wanted, we had not enough money to keep them with us.

SOCRATES: Since then, I suppose, people started to leave more and more frequently.

MÀGLIONES: It's true, the process accelerated! How could you know, Socrates?

SOCRATES: Maybe you will understand it by yourself later in our conversation. But tell me: do you really think that money is the only cause of this leakage?

MÀGLIONES: To be honest, Socrates, the rumors circulating about our troubles in business may have alarmed our craftsmen. Many of them have families to care for, I can understand their worries.

SOCRATES: That's very noble of you, Magliones. However, what does it all implies for the drawing on your papyrus?

MÀGLIONES: Another arrow, I fear, ranging this time from "**Poor Performance**" to "**Inability to attract or retain good craftsmen**"... (Figure 8)

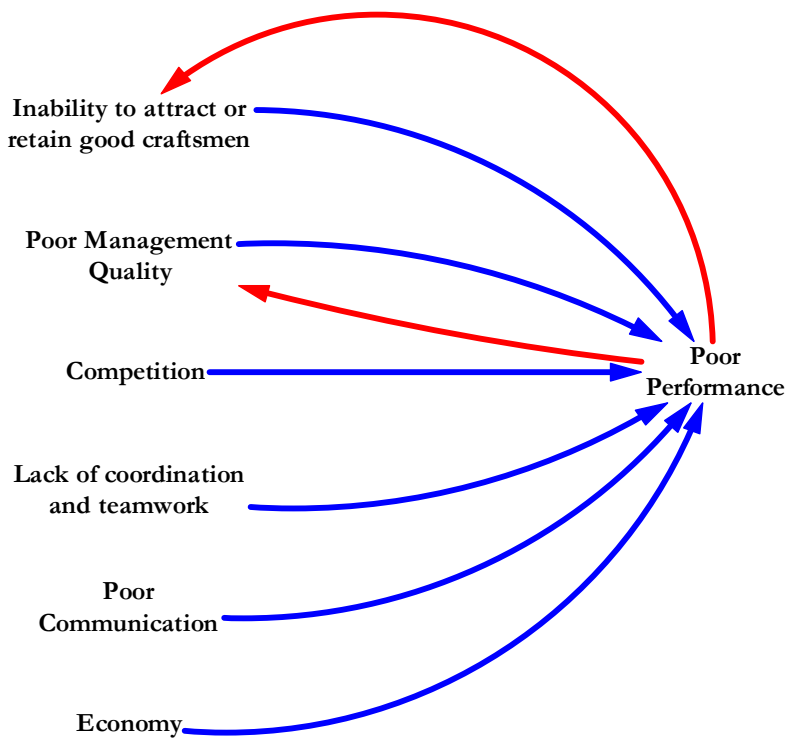


Figure 8

SOCRATES: So what is happening, Magliones, to your elegant scheme?

MÀGLIONES: It is getting quite complex, Socrates. Also because I can see now that I’ll have to draw another arrow from “**Poor Performance**” to “**Competition**”. As a matter of fact, I remember that when our business started succeeding, new shops sprung up like mushrooms. A clear evidence that competition reacts to our performance. Moreover, I didn’t realize that there is something wrong in the names I assigned to causes and effects. They are not so precise as I thought, and many of them are expressed in negative form. Is “Poor Management Quality causes Poor Performance” equivalent to “Management Quality increases Performance”? Maybe I should specify better what kind of influence, and in which direction, a given cause has on a given effect.

SOCRATES: I agree, Magliones. We’ll need to face this problem later in our conversation. Back to your competitors, I can somehow understand the gist of your hint . As soon as you reduced the price of your pots, in order to sell more and improve your performance, competitors – I bet - copied your decision, rapidly canceling the effects of your actions.

MÀGLIONES: That’s what happened. Performance influences competitors. I feel that even for other items on the left column return arrows are appropriate. (*Scribbling a bit*). Here is the new pattern! (Figure 9).

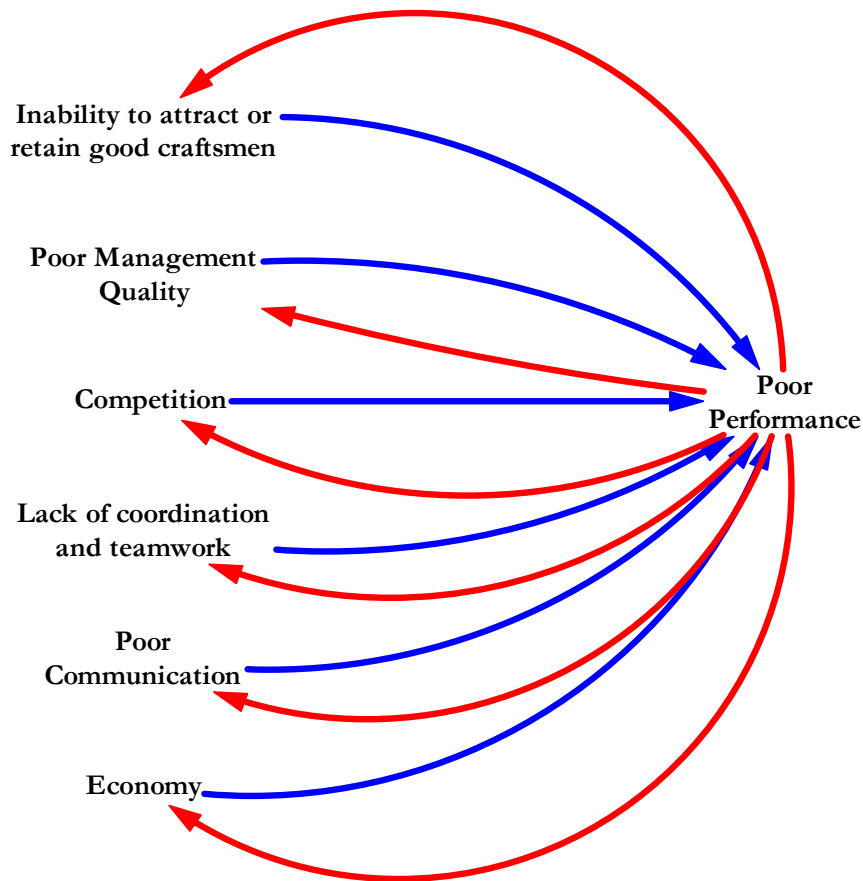


Figure 9

SOCRATES: A new pattern? Why a new pattern? Perhaps it portrays a new condition, other than that we discussed since the beginning?

MÀGLIONES: Not the condition, Socrates: the way my eyes watch it is new!

SOCRATES: Maybe you're right. But let us proceed with our method.

MÀGLIONES: Do you mean that my drawing is still not complete? Twelve arrows seem enough, don't they?

SOCRATES: Maybe, Magliones. But I was wondering: would you say that a good potter, who learned his job through years and years of training and experience, knows what he's talking about in matter of pottery?

MÀGLIONES: You can bet he does, Socrates.

SOCRATES: Just what I thought, too. And maybe, after so many years, he has learned to know which are the most fashionable shapes, or how to safely transport his pots to the market, or whether their price is fair or not.

MÀGLIONES: Definitely.

SOCRATES: So let's assume that the manager supervising him is prone to make evaluation mistakes,

or poor decisions, or finds difficult to understand the basic processes of the potter's work: will the craftsman work willingly with him?

MÀGLIONES: I understand what you mean, Socrates. "Poor Management Quality" generates "Inability to attract or retain good craftsmen" and that's another arrow to add to our scheme. No, please don't add other hints... I can clearly see that an organization unable to retain its best craftsmen creates problems to its manager, who has to achieve his results through ineffective potters: so we need another arrow in the reverse sense too and .. (Figure 10)

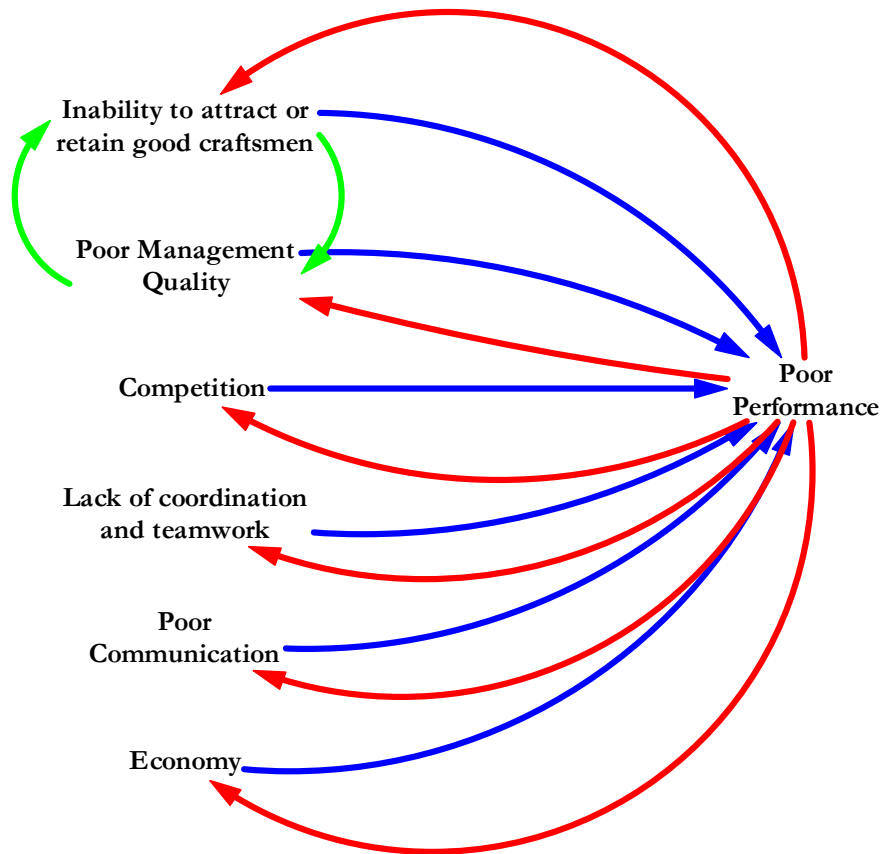


Figure 10

SOCRATE (to Sapylos, while Magliones keeps scribbling on the papyrus): How brilliant your young friend is!

MÀGLIONES: And finally here is the complete structure! (Figure 11)

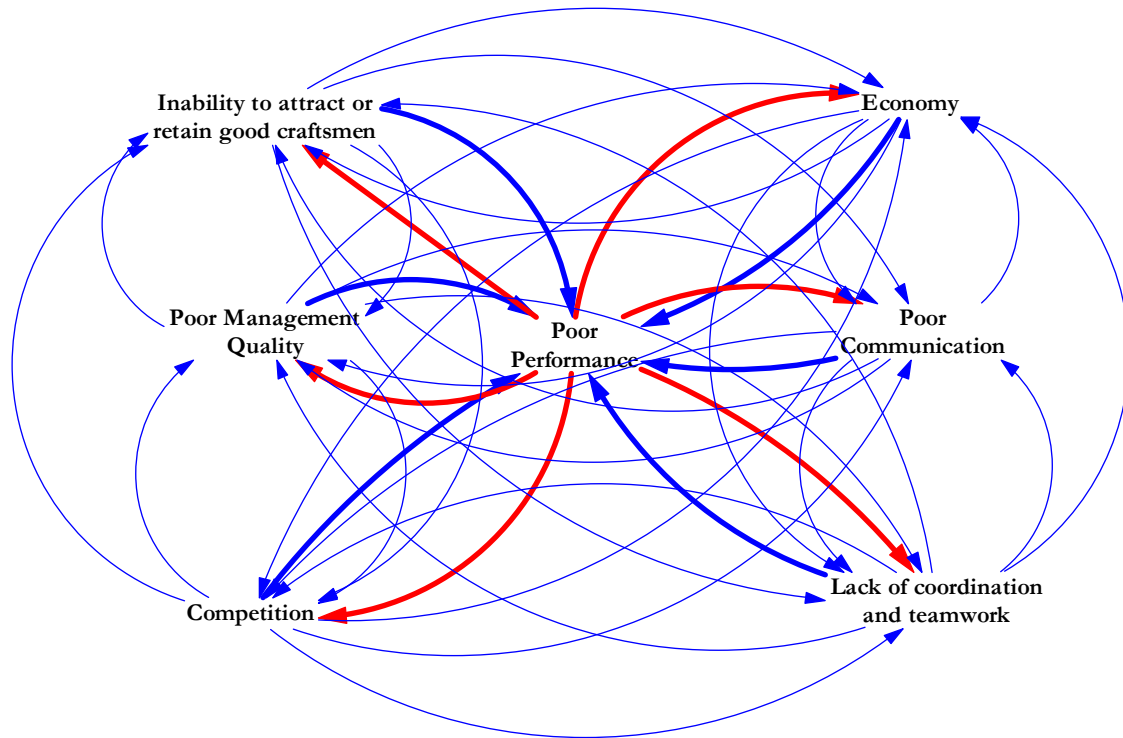


Figure 11

SOCRATES: For all the gods, it no longer looks like the initial drawing!

MÀGLIONES: Not indeed, Socrates.

SOCRATES: Honestly, I feel a bit relieved. Your initial scheme reminded me of the shopping list Xantippe every now and then tries to hang on me when I am pointing to the neighborhood of the market. Now I can no longer see neither the left column, the the causes set, nor the right one, the effects list.

MÀGLIONES: It would not make sense, Socrates: I couldn't say, now, *which of them is a cause or an effect*. It seems to me indeed that everything in the drawing is *both cause and effect at the same time!*

SOCRATES: Pretty weird, isn't it Magliones? It seems that the quality of being cause or effect depends on its frame!

MÀGLIONES: On its frame? We were talking about potters, Socrates, not painters!

SOCRATES: Sorry, I'll try to explain it better. Please, Sapylos, hand that papyrus to Magliones. Now, Magliones, try to roll it up as to shape a sort of flute.

MÀGLIONES: (*alarmed, glances at Sapylos*) ...ok, ok, Socrates. But what should I do next?

SOCRATES: Now move one end of the papyrus near your drawing, close to “**Poor Performance**”, put one eye at the other end, and describe what you see.

MÀGLIONES: It depends on how far from the drawing I place the papyrus. Now, for example, I can see only “**Poor management**” and the arrow connecting it to “**Poor Performance**” (Figure 11a).

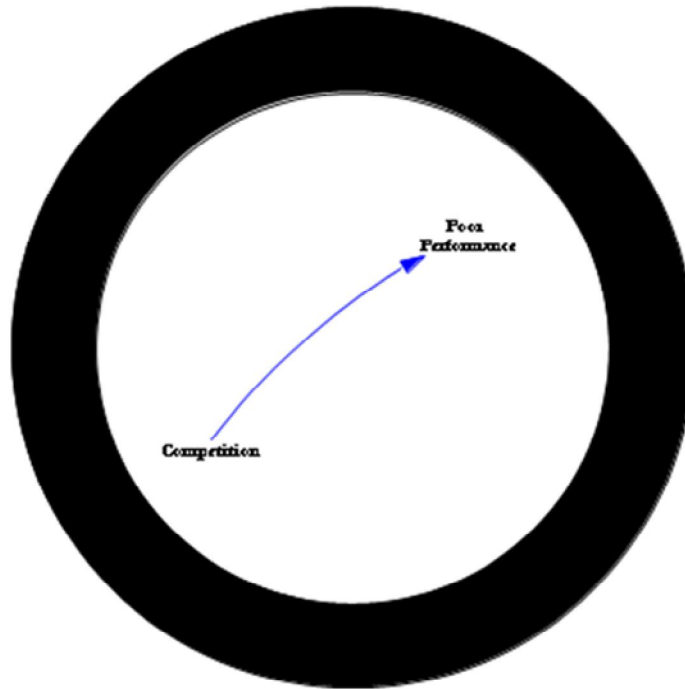


Figure 11a

SOCRATES: Quite normal, Magliones. A simple cause and effect pair, the kind we can perceive every day. But now try to push the rolled up papyrus a little away, let's say a foot from your drawing. Are you still able to see separate causes and effects?

MÀGLIONES: Now I understand what you mean by frame, Socrates. At this moment i can see several arrows spread in every direction, and the world seems much more complex than it appeared in a closer perspective (Figure 11b).

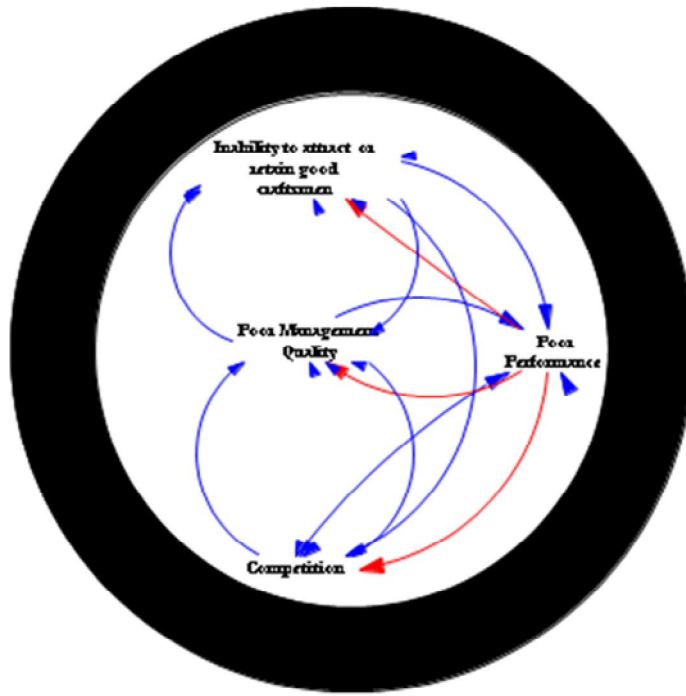
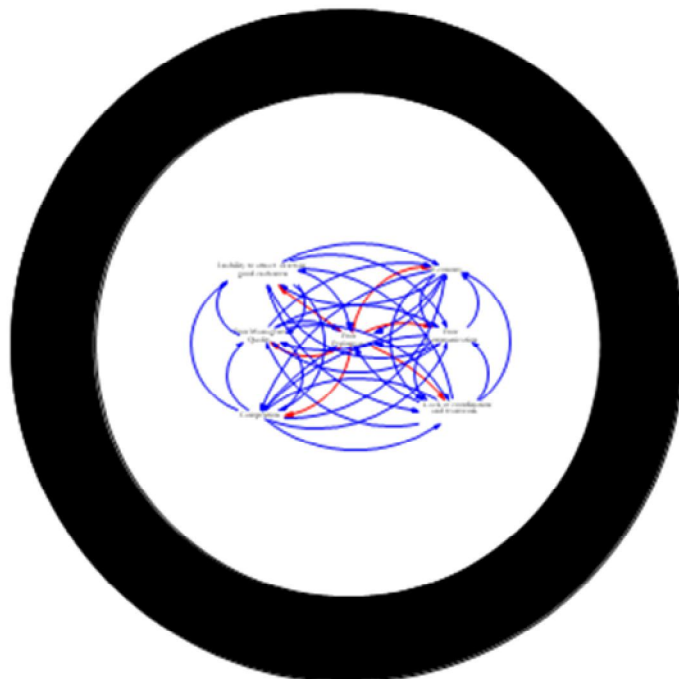


Figure 11b

SOCRATES: What about completing our experiment, moving a further step away?

MÀGLIONES: Too far, Socrates. From such a distance I can see the whole drawing: I just perceive that it is full of arrows and words, but the drawing is too far away to read the names and distinguish their connections (Figure 11c).



SAPYLOS: Let me conclude, my dear friends, that the best “distance” to look at complex things should not be too close, so that we can see more than single details alone, nor too far, in order to prevent losing touch with real things. Rather, a good middle ground: how could I expect anything different from you, Socrates?

SOCRATES: Mesoscopic, Sapylos, I’d call such a perspective “mesoscopic”.

MÀGLIONES: Wondrous! Your new knowledge device is really wondrous! We might manufacture it in hundreds of exemplars converting our craftsmen, and sell it as the ultimate management tool... A papyrus reed people can look through with a single eye, sometimes close, sometime far: I would suggest a name like “telescope” or something ...

SOCRATES: Maybe in the future, with just a few modification, it will be used for something quite different from opening our minds. But let’s put aside your “telescope”, for the moment, and try to observe your structure more carefully, Magliones: perhaps a picture can tell us something more than words alone... What is the most striking difference between the old and new versions?

MÀGLIONES: Let me see ... While at the beginning the arrows had a clear and specific orientation – cause to effect – now I only perceive wandering arrows - as if they were circles ...

SOCRATES: Right. Your initial diagram reflected was what we might call a *linear causality*: its symbol was a line with a direction, an oriented line segment; as you said before, “causes clearly separated from effects”. In the last version instead we have a sort of *circular causality*, travelling in both directions, and as you well described it is represented by circles, lines returning back on themselves. But back to the original pattern: let’s start from any item, say “Poor Management”, and try to get carried by the arrows. What do you note?

MÀGLIONES: Nothing at all: “poor quality” produces “poor performance”. Full stop.

SOCRATES: Is that all?

MÀGLIONES: So it seems to me, Socrates.

SOCRATES: All right. Now let’s repeat the same process for your final drawing. Any change?

MÀGLIONES: Again, poor quality generates bad performance. But, look! “Poor performance” in turn worsens management, leading to a further deterioration of performance, and... curious, as I follow the causal path, this relationship seems to begin cycling on itself!

SOCRATES: Certainly, Magliones, the circle is a figure that closes on itself, as every schoolboy should know. Well, does it suggest you anything?

MÀGLIONES: It would say that linear causality looks in some sense timeless: from here to there, then

the process ends, a static concept. Circles, on the contrary, capture time. A manager starts making mistakes, performance worsen in time; and after a while performance starts influencing the Manager who, under pressure, will take other poor decisions, impacting again results, and so on.

SOCRATES: Do you mean that circular causality captures a dynamic view of the world?

MÀGLIONES: Definitely, Socrates.

SOCRATES: Now let's walk away from details and to try to compare the two drawings from a little more far away. Telescope in mesoscopic position, remember? Any suggestion?

MÀGLIONES: Order, Socrates. In the first drawing the world seems simpler and orderly: causes on the left, effects on the right. Even solutions to our troubles look straightforward: we act on the left to get changes on the right; if we do it correctly we have solved our problem. Our focus, the point where we need to direct our attention in order to verify the results of our actions, is just one: where all the arrows end.

SOCRATES: True.

MÀGLIONES: Then, you remember, I started modifying the diagram. I scattered the items here and there around "Poor Performance", because the concept of cause was beginning to blur. My "shopping list" gradually was turning into a network. Yet a single item – "Poor Performance", the starting point of our analysis, the only item connected to all the others, still towered in the center of the drawing, like a spider in the middle of its web. But since I started to reciprocally link also the "peripheral" items, like in our final structure, identifying a "center" has become really hard. A "spiderweb" structure is still quite regular, because it is symmetrical enough and manifests a preferred direction: toward the center. Rather, our last drawing looks much more like a fisherman's net, everywhere dense and intricate.

SOCRATES: So it seems to me. But let's step back, Magliones, to your method. If I correctly remember, you said that, once you recognized and traced the relationships, you had to identify the most important factor, then the second, and so on.

MÀGLIONES: Exactly, Socrates. As I said, I'm used to set weights through fractions according to the methods of ...

SOCRATES: Okay, okay. But, in our last structure, can we still speak of "most important" cause?

MÀGLIONES: I really don't know, Socrates. You see, when our organization was doing well, I felt that our problems mainly arose from the arrival of fierce competitors, that until then hardly seemed to exist. But later, when we started losing sales, I realized that our performance suffered most from the loss of our finest potters. Still later, the real problem appeared managing a group of artisans with little experience and even less motivation.

SOCRATES: So do you still think that it is correct giving a weight just once and for all to each of your “causes”, and on this basis identifying the course of actions to be taken?

MÀGLIONES: To begin, Socrates, I am not sure we can still speak of *causes* – maybe we should restrict the term’s use to describe relationships among things *in close detail, locally* I’d say - but rather of groups of things that interact in circles (and we must find a name for this new concept). Secondly, I think I can say that different groups of relationships rule over the whole system at different times, and that this “dominance” is not fixed in time, but changes in time and perhaps under different conditions.

SOCRATES: So it seems that, rather than a cause, an area of the network controls the behavior. And that, under this new perspective, this dominance shifts throughout the network from one area to a different one, at different times, depending on the history that the system has followed: first, a group of relationships plays an essential role in determining what happens, then it loses its importance, and another set of relations replaces it in driving the further evolution.

SAPYLOS: Dear friends, it’s getting late: so let me summarize what we have so far concluded by reasoning together.

First: the most natural way to see things - and told in confidence, I think that we all spontaneously think so - is to explain them in a perspective of linear causality: there are causes and effects, clearly separated from each other. We are not used to consider also reciprocal relationships: causes are causes, effects are effects. The problems can be solved by acting on the causes, and results are checked by focusing on the effects, that are the true “center” of the system. Every cause has its ranking, its “weight” in contributing to a given effect: so we expect that the results we’ll get ultimately depend on the action we apply to the causes, and the “weight” of each cause on the effect. Even in this sense, the perspective of linear causality is essentially static.

Second: we can alternatively see things in a perspective of circular causality. Instead of moving in a single direction (from cause to effect), this sort causality can go in both directions. There is no main “thing” that is caused, nor is it possible to identify a set of pure causal factors: everything is both cause and effect. There is no longer a center of the problem: so the number of elements to be monitored grows up, because each of them is a point where the effects of several actions converge. Its metaphor is the net. There are nothing such a ranking or “weight” for each cause; rather, as the system evolves, the dominance shifts among groups of circular relationships, which in turn will take on prominence in determining the way that the system will change. Even in this sense, a circular vision of causality is historical and dynamic.

SOCRATES: As always, or Sapylos, your ability to understand the synthesis of a dialogue is peerless.

MÀGLIONES: Sapylos told me that I would come out of this visit with more questions than answers, and in this regard...

SOCRATES: It's getting late, Magliones, for other topics; for the present, let us make an end of the conversation. But, if you want, tomorrow we will resume our dialogue from this point, God willing.

Thanks to Barry Richmond for inspiration