

exploring

Collective Intelligence

The CICS Model

**Capabilities defining
intelligent teams**

Supplementary text

THE CICS MODEL

In general, the human being can be described as a marvelous cooperator. Our societies would not work a day if people did not constantly cooperate. Traffic, schools, work places, stores, communities etc., they are all dependent on our ability to cooperate.

As organizations become more complex, collaboration is becoming even more crucial for organizational functionality. The reason is that organizations are much more dependent than they used to on a specialized workforce. This implies that employees must share and integrate knowledge on a broader scale to adapt and profit from the, inevitable, increased complexity.

However, research studies show that groups usually fall short of what could be called their reasonable potential productivity baseline. In other words, groups usually do not attain the performance level of their most capable member – and even fewer studies report groups exceeding this level. This indicates that groups perform fairly poor in distributing and integrating their knowledge.

The skill of sharing and integrating knowledge within teams to gain leverage of all group members can be referred to as *Collective Intelligence*. We claim that all teams need to work on this skill. However, most of today's companies tend to focus more on structure and development of individual competences, than on collaboration among the individuals within these structures.

Why is collective intelligence important?

The reasoning above implies that the relatively poor results of groups are not due to a lack of ability or capacity, but rather due to inefficient teamwork. It seems like we, as humans, both support and disturb each other when we work in teams. Let us have a look at some examples:

- Groups working on *well-structured problems* tend to perform at the same level as the second-best individual within the same team would do on his/her own.
- Groups working on *unstructured problems* achieve results that are quite similar to the results the groups would obtain if they just randomly performed different actions.
- *Unfacilitated* teams doing creative work, i.e. teams where team members work individually without cooperation underperform in relation to facilitated teams.

These are all examples of what could be called “disturbances” of teamwork.

The first example displays that the knowledge and skills among the team members are not utilized to the fullest during cooperation. Part of this is explained by the procedural challenges of teamwork: It is more time consuming to listen to everyone, make decisions, organize etc. in a team. This is called the *process costs* of teams. Other parts are explained by social processes that “interfere” with the knowledge exchange, so called *social costs*.

These costs offset the benefits of teams, benefits referring to having more brains available, more hands and feet etc. Thus, in the case of a well-structured problem, the conclusion is that the final result seems to be a slight profit.

In the second example, the challenge is a complex problem with no right or wrong answer. Thus, the second example is more similar to a real working situation. The example exhibits no advantage for the average team, at all. This could be explained by the challenge represented by the task of *defining the problem setting*. Discussing and concluding on what the problem setting is, demands far more advanced teamwork than the type of teamwork described in the first example: If we do not have a shared understanding of the problem, it is not possible to discuss solutions.

In the final example, the situation can be exemplified by a team having a brainstorming session. The average results of brainstorming performed in a team tend to be more negative than positive. However, the process can be improved in a very simple way. For example, studies show that teams where people first brainstorm on their own, document their thinking, and gather and share their ideas afterwards, are more efficient than when they brainstorm together. Brainstorming together implies having to listen to other people's ideas. It *could* be positive since it can generate new ideas among the listening individuals. However, it could also be negative since it draws attention away from individual, perhaps diverging, thoughts. This last example shows how simple methods and procedures can support collective intelligence, if we only understand how it works.

It seems as if teams can perform better by facilitating a meta-process when integrating their knowledge. To support this process, there is a model that explains what knowledge integration and collective intelligence is. The model creates a shared idea of what teamwork is, and by providing the team with a reference point it enables more efficient discussions since the team then can identify what they need to work on, improve, or get help with.

The CICS-model and the four capabilities

For an organization to be effective, it must develop its capacity to create both effective task processes and social processes. These are also the challenges that the CICS-model addresses. It does so by decreasing the inhibitors related to the social processes by providing tools for groups to share and integrate knowledge, and by supporting the development of individually intelligent team behavior. Through proper and structured training any group can improve their collective intelligence.

The four capabilities of the CICS model:

Representation: The team's ability to formulate an adequate shared picture (mental model) of the task and its setting, that can guide their everyday actions

Reflection: The team's ability to learn from shared work and to improve the understanding of the task

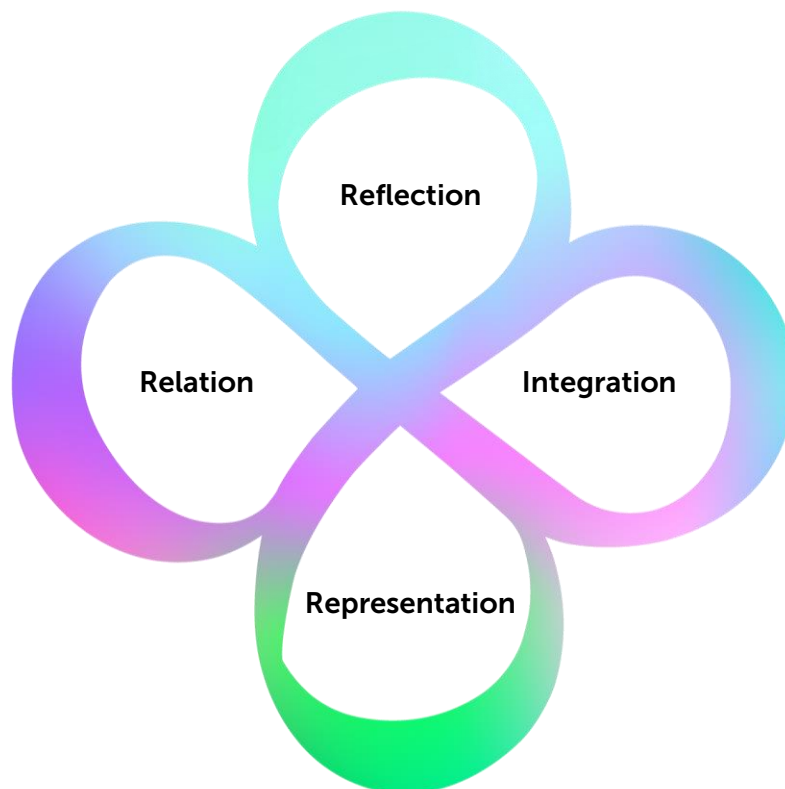
Relation: The team's ability to create an open and safe social climate where team members have trust in each other's capabilities and intentions

Integration: The team members' ability to act as a coordinated unit based on their supportive behavior, with attention and care for the shared task and each other

The two axes of the model are:

1) The collective axis (Integration and Relation): Integration and Relation are closely related. Warm and safe relations in a group are prerequisites for group members to fully integrate their knowledge. It affects both what people dare to say, and how they choose to listen. The relations within a team stem from how the individual team members behave. Warm relations come from individuals choosing to act warm in relation to each other.

2) The knowledge axis (Representation and Reflection): Representation and Reflection are closely related. Reflections will reinforce and/or update the shared picture of the task. The current shared picture of the task is the basis for reflections and coordinated actions



Representation: the ability to formulate an adequate shared picture of the task and its setting

The representation capability is about being able to create and maintain sufficient consensus of the task and team, and to appropriately allocate the resources available to solve it. Different individuals have different knowledge of and perspectives on situations. When solving a task, the challenge is therefore to combine perspectives without losing orientation. Several aspects and too much complexity can make the situation unmanageable and chaotic,

which in turn can lead to endless analyzing and, in worst case, the group lacking an ability to act.

Reflection: the ability to continuously learn

Reflection capability can be described as a group's ability to extract its members' individual knowledge and to integrate it. The aim is to get a high utilization of everyone's unique knowledge and skills (think: what percentage of the individual's knowledge becomes available to the group) while shared knowledge is enabled to grow beyond the sum through a dynamic team process (think: is the sum of the group's knowledge more or less than the participants' accumulated knowledge?).

When a group has good reflective capability, it means that the individuals can coordinate individual learning into collective problem-solving processes. It is the ability to reflect upon and learn from specific situations and turn insights into coordinated collective behavior. Individuals in a group will always be at different reflective levels, some work with the problem definition while others focus on problem solving. The dynamics of these situations can result in either a valuable discussion that takes the group forward and helps it to gradually improve problem setting and solution of the task, or it can limit the group by creating disturbances between group members.

The group's representation capability can be described as the ability to complete the task with as many different aspects, knowledge sets and perspectives as possible, while maintaining visibility and manageability. A group with a strong representation capability shares the same representation, i.e. there is an agreement and common understanding of the task. We can summarize this into two basic challenges: 1) to establish a representation which is as close to the complex reality as possible and 2) to create sufficient and continuous conformity in the understanding of the task, i.e. shared representation.

Relationship: the ability to create an open social climate where members trust each other

This is fundamental in building trusting relationships within a group. It is achieved by establishing psychological safety amongst individuals as well as creating confidence in the skills of each member. It is of high importance to develop confidence in the group's ability to tackle difficult issues, a kind of collective self-confidence. If the group has high confidence in its knowledge it can also be expected that the individuals' desire to try to understand each other is higher. Also, if the group has high confidence in its knowledge, group members will more frequently and willingly use the other members' specialized knowledge (if one suspects that someone else is unable to perform his/her task, one will spend part of one's attention monitoring that person, hence stealing attention from work and the actual knowledge sharing needed to perform well).

Integration: the ability to act as a coordinated unit based on supportive behavior

The group's integration capability is primarily about the individual participant's behavior. This dimension is important because it explains why a group will never be effective by solely addressing overall ability: Individuals continuously contribute with their efforts to dynamically and flexibly coordinate themselves with the team and the other team members. This critical effort is controlled by the individual alone, not the team. A group's integration capability is therefore based on the participants' ability to be sensitive to the group's needs. But what often is forgotten, is that this sensitivity must include the individual's *own needs* as well. That is, it also includes the question: what do I need to be able to act supportively and contribute?

This reasoning can be compared with the concept of an orchestra. A member of an orchestra must know and continuously work on her own individual skills, while at the same time coordinating with her team – the orchestra. If the member nourishes her own technique and skill, it will contribute to the entire orchestra as well. If the member overestimates her capabilities, she will not strengthen the orchestra. If she acts with courage and strength when the orchestra faces setbacks and failure, the member will contribute to the orchestra's strength and will to perform.

Teams are dynamic systems

In conclusion, the four capabilities are connected, meaning that collective intelligence is a dynamic result of the connections between the capabilities. Thus, to understand the model, one should understand that any team of people represents a dynamic system. The rules for such a system are

- If one capability changes it affects the other capabilities
- Change can be initiated from any position, allowing many different strategies
- Since effects are reciprocal, the best strategy is to work with all capabilities simultaneously

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