Supporting the Decision Taker
by Coaching and Expert System

PDW Proposal No. 10220

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Abstract

For nearly two decades we have been trying to find appropriate ways to support the business decision taker and spent most of our academic research and consultancy time on the issue, as well. With this workshop we would like to invite the audience to explore by asking relevant questions about the appropriate mode of support for managerial decisions based on various situations, decision styles and thinking processes. Our bottom line is a knowledge model, according to which we distinguish between knowledge of facts, skills, and intuition. Each of these knowledge types has a focal and a subsidiary part; making altogether six knowledge types. Each knowledge type requires different kind of support and each decision requires different blend of knowledge types. Our aim is to show the audience how to distinguish between the knowledge types and help them to recognize the required blend for the particular decision. Based on this, the audience should be able finding adequate questions regarding their decision, based on which they can seek appropriate ways of supporting the decision taker. The workshop starts with outlining our knowledge model. After this we will very briefly introduces two kinds of support, namely executive coaching, as we view it, and expert systems. The audience is then invited to ask for clarification of these ways of support as well as to discuss their chosen decision. The intended outcome of the workshop is a clearer understanding of the knowledge of the decision taker and hands-on experience in asking the appropriate questions.

Presenters: The 4 persons running this workshop are different in many ways: 2 of us are academics and 2 professional business consultants; we work in 5 different countries; we have backgrounds in various relevant fields… There is one common thing about us: we share the passionate interest in supporting the work of the business decision taker.

Audience: This PDW is aimed at academic professionals researching and/or educating business executives and executive coaches.

Proposed timeframe: 2 hours

Introduction

The four of us have spent many years in working *with*, *for*, and *on* business decision takers in various ways. Two of us worked as executive coaches, three of us were doing research and publishing academic papers and books about business decision takers and how to support them, three of us worked as knowledge engineers and developed the knowledge-based expert system Doctus, two of us are academics, and all of us are involved in teaching in one way or another at higher education institutions.

In this PDW we will present our knowledge model, which serves as basis for finding the appropriate support for decision takers. In this model we distinguish six types of knowledge; each of them calls for different type of support and each decision problem (into which, apart from the decision situation, we also include the decision style and the thinking process of the decision taker) requires a different blend of knowledge types. Once thus this framework is established, we will introduce two types of support: One of us will be in the role of the coach and introduce the executive coaching, more precisely, executive coaching as we see it. Another member of the team will act as a knowledge engineer and introduce the Doctus knowledge-based expert system. These introductions will be very brief; we do not aim at providing a thorough understanding, only a first glimpse. The audience is encouraged to ask for clarification during the whole workshop – and after it as well. The remaining two members of the team will take on the role of business decision takers seeking appropriate support for their decision problems.

While in the first part of the PDW the audience learns distinguishing the various knowledge types, in the second part they should explore identifying the different blends of knowledge required for particular decision problems. They may choose from two different roles for themselves: either they formulate their own decision problem for which they are seeking support, or they can help others (i.e. the two members of our team acting as decision takers and/or their fellow participants who formulated their decision problems) by identifying what are the relevant questions to ask. The participants do not necessarily have to remain in the same role all the time; they may shift back and forth between the described roles.

The knowledge of the decision taker

Our knowledge typology is based on Ryle's (1949) distinction of 'know-that' and 'know-how'; the same categories were identified by Anderson (1983) as propositional (declarative) and

procedural knowledge. Gurteen (1998) identified a further type that he called 'know-why'. We add further two categories, 'know-what' and 'know-it'. To organize these knowledge types into a more comprehensive model we use Polanyi's conception of tacit knowledge (Polanyi, 1966) and, based on this, the distinction of focal and subsidiary knowledge (Polanyi, 1962). Based on these, our knowledge typology is shown on Figure 1.
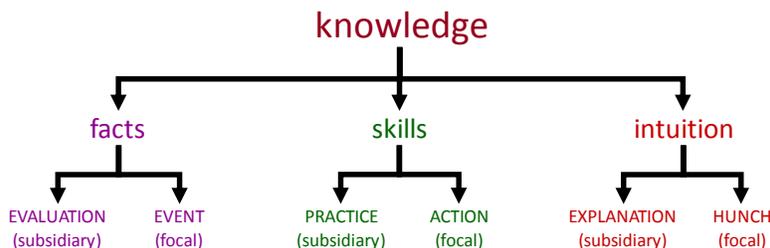
knowledge

facts · skills · intuition

EVALUATION (subsidiary) · EVENT (focal) · PRACTICE (subsidiary) · ACTION (focal) · EXPLANATION (subsidiary) · HUNCH (focal)

Figure 1: Knowledge types

The focal part of facts is the *event*. This corresponds to the 'know-it'; this knowledge is tacit. The subsidiary knowledge of facts is the *evaluation*, i.e. the rules of evaluating; this is a 'know-that', which is explicit. For example, the jump of a pole-vaulter is a fact. Its subsidiary part is the knowledge about the measuring standard and how to use it. The focal part is our experience of the jump; this includes e.g. that the bar did not fall down. As we see, the focal facts are something much richer than what is usually called facts; it includes the qualia (Chalmers, 2003). Second-hand facts (De Bono, 1976: 12-14) belong to the domain of propositions, i.e. they will not be focal but subsidiary facts. The essence of the second-hand facts is not the correspondence to the reality but the controllability; e.g. we can check in lexicons that Lee Harvey Oswald killed Kennedy, so it is a fact even if we cannot be sure whether it is true.

The focal part of skills is the *action*, the 'know-how'. The subsidiary part is the set of *rules of practicing* and second-hand facts about practicing, which is 'know-that'. E.g. the act is movement with the bicycle with the subsidiary rules of keeping the balance. Experiencing events and skills are both experiences but while the former is passive the later is active.

The focal intuition is the *hunch*, when one senses the direction, which is 'know-what' or the solution, which is 'know-why' (see strategic and concluding intuition in Polanyi & Prosch, 1977). The subsidiary intuition is the ex post *explanation* which has to follow the rules of formal logic strictly, regardless whether it was how the hunch happened or not. It is a useful image to describe hunch as applying a number of rules tacitly at the same time, as Simon (1987) did but with Mintzberg (1994) we believe that the synthesis it achieves cannot be derived from analyses. To contrast the focal intuition to the previous two types of focal knowledge we can say that those were both external experiences while the hunch is an inner experience.

For the purpose of this workshop, we examined what kind of support can be provided for the different knowledge types, the result can be seen on Figure 2. We have found that the subsidiary knowledge types require accessories for support while the focal knowledge types need consultants. The types of consultants and examples of accessories we identified can be seen at the bottom part of the picture. In this workshop we concentrate on the intuitive decisions; the subsidiary intuition, the explanation, we support with the Doctus knowledge-based expert system and the focal intuition, the hunch we support with executive coaching.
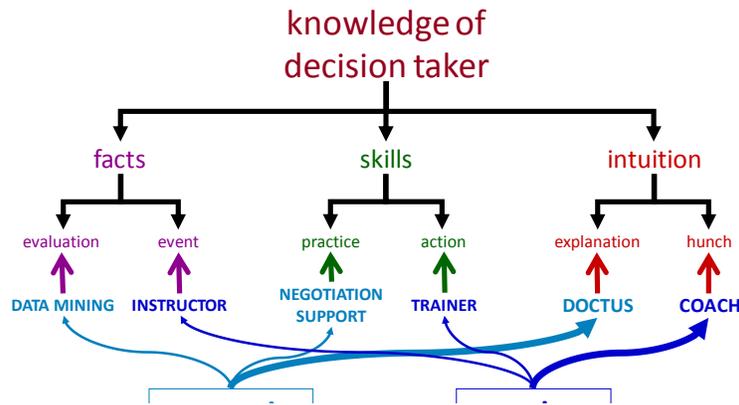
Figure 2: Supporting various knowledge types

The Doctus knowledge-based expert system

Several epithets can be attached to Doctus: it is a knowledge-based system (KBS), meaning that it works using knowledge bases that are concepts connected with logical «if… then» rules; it is an expert system (ES), as we build the knowledge bases acquiring the knowledge from experts; as we mostly used it to support decision takers, it may also be called a decision support system (DSS); due to the use of symbolic logic (the already mentioned «if… then» rules) it also qualifies as symbolic artificial intelligence (AI). We tend to avoid the term DSS as we would not like to be confused with those offering tools to substitute the decision taker under this label. We also refrain from using the term AI not to scare off the users. As we aim at supporting the decision taker by providing her/him with the representation of the expert opinion we usually combine the first two labels and call Doctus a knowledge-based expert system (KBES).

We have developed the first version of Doctus based on Simon's conception of bounded rationality (Simon, 1997), his distinction of programmed and non-programmed decisions (Simon, 1977), and on our view of knowledge. Working with Doctus for 18 years, we had around 140 consultancy projects, the vast majority of them for top executives; in addition to this, it was used in many hundreds of student projects at many universities all over the world and in our own research projects.

There are three ways of using Doctus: In *deduction* or rule-based reasoning, the expert defines the criteria of the decision (attributes and their values) and the rules between them; then these rules can then be applied to evaluate cases. In *induction* or case-based reasoning the expert provides the criteria of the decision and the outcomes of cases from their experience; then Doctus finds the rules that can describe these cases. Our most recent and, as far as we know, unique type of reasoning is called *reduction*. The name refers to reducing the number of attributes to describe a particular decision. This is done by applying the inductive reasoning first, and then converting the resulting inductive knowledge base into a new deductive one; this new knowledge base will classify the cases in the same way as the original one, only using fewer (often significantly fewer) attributes. We sometimes use all the three ways of reasoning together, i.e. we build a deductive knowledge base first, apply it to a number of cases, then convert it into

an inductive one to find the most informative attributes and the rules between them, and finally we convert this into a deductive knowledge base again – this way the benefits of reducing the number of attributes is the most evident.

The process of creating a representation of the experts' knowledge in Doctus is called knowledge engineering, and the person doing this is the *knowledge engineer*. There are two other participants in the process of knowledge engineering, the expert (or experts) whose knowledge is acquired and the decision taker who we want to support. Developing Doctus for nearly two decades, we think we can be proud of what we have achieved. Doctus became a remarkable tool with very few if any equals. It can be connected to all kinds of databases to import what is there; it can be fed via email, various online solutions, etc. It can export knowledge bases in forms of various automated tables, WebPages with on-page reasoning, different desktop and server applications; we even exported a complete intelligent portal from it. It also features fancy analyzing tools, and many-many more.

However, we lost something in the process. We worked as knowledge engineers spending quite a lot of time with the experts to provide the support to the decision takers. When Doctus stepped into adulthood, we reviewed what we achieved, and realized that most of the features support the knowledge engineer, some the experts, and probably the reduction is the only feature that is aimed at the decision taker. So, while trying to support the executive, we got lost in the work of the analyst. We forgot asking the relevant questions. The tool that we include in the workshop is a renewed Doctus, codenamed DoctusLight. We have ruthlessly cut off many of its (analyst) features and made it more playful. It is now a tool for the executive.

Executive coaching

Whenever you come across something radically new, you had better not label it with old terms, because new ideas may also bear new values. What a change to go to the bank to check your account or just check it through your cell phone. It is a whole new world. You may also lay your bets or pay your airfare through your cell phone now.

Who is the coach in this new world? To use an example from sport, the coach is the guy running up and down at the sides of a baseball field trying everything to make his team win without ever hitting the ball. How long does (s)he coach the same team? For a few years at the maximum. The coach teaches the players all (s)he is supposed to or can, then moves on. The team hires another coach and the coach is hired by another team. With Handy (2002) we believe that the coach has nothing but his reputation; so if the coaching has been successful, the reputation increases, if unsuccessful, it decreases. That is how it is and how it should be. Beware of consultants who offer non-interfering-coaching, who promise not to give advices – they surely will not give you any advices, at least, no useful ones. These are coaches with empty bags.

We should acquire two new terms: *pitch* and *serve*. However, you had better be careful how you use them. A radical idea cannot be served just pitched. A radical idea is ill-structured. Adaptation could be neatly served, therefore should be carried out by an instructor. You can only serve what has a clear and distinct structure. A coach does not serve just pitch. A well-served and well-

structured aspirin might heal you but there will be no radical changes. You will not get competitive advantage.

A friend told us that he always fails at the second meeting. He sells security software for banks and once a Greek bank inquired about his software. First, he talked to the IT manager who seemed thrilled by his program and suggested that they went to the general manager the following day. Next day they went to the CEO and this friend started to explain how to operate that software in the same way as if he had been talking to a specialist. He failed miserably, however, because he made the CEO look foolish. A specialist should always convert his explanation to the very needs of a decision taker; otherwise, (s)he is out of business before (s)he could say Jack Robinson.

You should be considerate to your business partner's needs and level of understanding. Let's talk about trust.

"I used to have a slide on business negotiations showing some puppies and files explaining that when you talk business, you should talk 60% small talks and only 40% business issues. I used to share that slide with a colleague of mine and once I changed it to 100% small talks wiping off all business part. She had her workshop, kept on talking about the original ratios when suddenly realized the change – she got quite angry with me, you can imagine. But, I got enlightened and started to use the new 100% slide."

When you start talking about coaching, first, you have to find a neutral common ground and watch each other's moves and drives to weigh up your partner. Look for the weak signs. The small talk means the very first step of growing closer and understanding your partner.

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