Knowledge discovery in case studies using the CI method

https://www.udemy.com/course/case-based-business-problem-solving/

The basic idea of the **Case Insights** method, abbreviated to **CI**, which you have learned in this course, is to discover knowledge through case studies and to make it usable for problem solving. Case-based knowledge is contained in authentic case descriptions, i.e. “good practice” or even “best practice” cases. Case-based problem solving uses this knowledge and adapts it to the requirements of a new problem.

Who can use this? Junior analysts and management consultants who are starting out in their consultancy careers can benefit in particular from the CI method as it allows them to expand their repertoire of experience on the basis of case studies, i.e. without being involved in projects. All those interested in solving complex management problems in a case-based way also form part of the target audience.

Case studies contain a great deal of problem-solving knowledge but only part of that knowledge can be captured through simple reading. The rest then remains difficult to access, a hidden treasure, so to speak. Why is that? The reason is that knowledge discovery in case studies is made more difficult by two obstacles: firstly, the texts are not sufficiently *brain-friendly* and secondly, they are not designed *holistically* enough.

A description is "brain-friendly" when it is "*based on the processing mechanisms of the human brain*" (Probst et al. 2012, p. 189). This is the case when the description is spatially structured and patterns are easily visible (CPM model by H. Benesch, 1987, 1988). And “holistic” is a description if it is based on networked thinking (Gomez & Probst 1999). This is the case when it emphasises the connection between the parts and takes various aspects into account (Benesch, 1987, vol. 1, p. 187).

This is exactly what the CI method offers: firstly, it analyses case studies with CI tools by comparing concepts, ideas, etc. and combining them into a whole; secondly, it makes the knowledge discovered in this way usable in the form of brain-friendly and holistic knowledge structures, the CI models. CI is therefore a method for the discovery of knowledge which, according to Kant, is *"... a whole of compared and linked ideas ..."* (Kant, 1781/1966, p. A97).

The "BASIC toolbox" of the CI method consists of 11 tools, divided into 3 groups:

A) CI tools for problem knowledge

Nr.	Abb.	Tool	Model	Lesson
1	ONP	OnePager	Onepager Window	7
2	TSA	Triadic Defects Analysis	TDA Chain	8
3	PTO	Socio-technical PTO Analyis	PTO Map	9
4	FST	Finding Stakeholders	Stakeholder Window	10

B) CI tools for solution knowledge

Nr.	Abb.	Tool	Model	Lesson
5	GSY	Goal system	Means-Ends-Hierarchy	11
6	SFM	Solution Finder Model	SFM-Network	12
7	SNM	Structure-oriented Network Modelling	Structure Network	13
8	CNM	Cause-oriented Network Modelling	Cause Network	14
9	TAM	Time Arc Mapping	Time Arc Map	15

C) Generic tools

Nr.	Abb.	Tool	Model	Lesson
10	MIM	Mindmapping	Mind Map	16
11	COM	Concept mapping	Concept Map	17

Knowledge discovery in case studies using the CI method

These 11 tools are selected as suitable for working on both problem and solution case studies, namely problems and solutions from any management discipline.

With this toolbox, we worked on an authentic management case study in this course, the KAPPA case study, in which the solution to a management problem from the field of knowledge management is described (Stocker & Tochtermann 2010). For each tool, in the lessons we discussed both the tool description and the knowledge structure which arose from my processing of the case study with the tool (sample solution).

The **One-Pager Window** offers orientation knowledge, a kind of panoramic view of the knowledge included in the case study: on a single page, the most important aspects of the project, the what, why, how and who, are described in a few words. This makes it easier to gain an overview of the core idea of the project.

The **TDA chain** provides a kind of “bird's eye view” of the problem area which can be very helpful as a basis for formulating the project goals. The focus is on organisational provisions and their consequences, especially with regard to defects. Their links thus provide problem knowledge that is very important for the formulation of the project goals.

The **PTO map** focuses on differentiating between important aspects of the main task according to the three categories of people, technology and organisation. The problem knowledge presented here answers the questions: which concept (aspect) in the case study is primarily human, which primarily technical and which primarily organisational and how are these areas structured? References to connections between the parts complete the knowledge structure.

The **Stakeholder Window** is an easy-to-understand representation of the main stakeholders in a project which are divided into 4 categories: 1. *Are not necessary* + benefit; 2. *Are not necessary* + suffer damage; 3. *Are necessary* + benefit; 4. *Are necessary* + suffer damage. This knowledge of the problem is very important in order to be able to assess the role of the 4 groups in the project in an individual, appropriate way.

The **Means-Ends Hierarchy** makes it easier to oversee and reflect on project goals, especially with regard to weighting and complexity. Goals are often insufficiently reflected upon or even remain unmentioned, such as the main goal in the KAPPA case study. By looking at the goals for a certain hierarchy level, you can see which goals have the same or a similar degree of abstraction; and when looking at all the sub-goals of a goal across different hierarchy levels, you can see, for example, the degree of complexity involved in achieving the goal. This knowledge is very important in the analysis in order to assess the solutions appropriately.

In an **SFM Network**, needs, objectives and solutions appear explicitly as independent elements. In addition, they are brought into a recognisable (not hidden, not implicit) connection based on the three connections *meaning* (B > Z), *achievement* (Z> L) and *fulfilment* (L> B). Units in which all three categories are represented and which link the three elements with one another, so-called *triads*, are a particularly important knowledge content of the SFM network because they mark the most valuable solutions.

The **Structure Network** shows solution knowledge in the form of an order or arrangement pattern and thereby helps to better reflect the principles of order. It visualises components of the main structure and the associated structural relationships with which the components are connected. When analysing organisational forms, these are leadership relationships, social relationships or command paths. In the case of processes, e.g., information flows, material flows, work sequences, etc., the structure relationships are functions or operations of the process between input and output.

Knowledge discovery in case studies using the CI method

The **Cause Network** contains knowledge about mechanisms of action (impact mechanisms). It shows the *root* of a problem or a solution and supports what is known as "**thinking in cycles**" which is an important resource for successfully dealing with complexity. Thanks to the causal network, special effect patterns become visible which are shaped as *cycles*. Such cycles are like "motors" that drive what happens in the network. These networks thus provide critical knowledge for understanding the mechanisms of action of the system under investigation.

The **Time Arc Map** is a mixed diagram: an extension of the project schedule (timeline, Gantt chart) with a breakdown structure plan (task tree, activity tree) and conceptual map (relationships between sub-tasks or sub-activities). This knowledge can be useful when designing (drafting) a new solution to optimise the process of implementation; but also, when analysing an implemented solution, such a mixed diagram can be useful as it helps to better understand the logic of the implementation.

The **Mind Map** is a hierarchical diagram that is used to visually organise thoughts (concepts). It is always suitable for knowledge discovery when it is not yet clear how the terms are linked to one another (relationships).

The **Concept Map** is a diagram that visualises concepts and their relationships. It has the advantage of making all elements of a thought comprehensible at a glance. It thus offers the opportunity to make better use of knowledge, e.g. through quick reflection.

Literature

- Benesch, H. (1987) dtv-Atlas zur Psychologie. 2 Bände. München: dtv.
- Benesch, H. (1988) Zwischen Leib und Seele. Grundlagen der Psychokybernetik. Frankfurt a.M.: Fischer Taschenbuch Verlag.
- Bernhard, W., Bettoni, M., Mirata. V. & Bittel, N. (2015) Vom Bedürfnis zur Lösung: wie mit Hilfe der SFM Methode das intelligente Büro entsteht. Organisator / Fit im Job, Nr. 06, S. 23-24.
- Bettoni, M., Bernhard, W, & Bittel, N. (2013) Collaborative Solutions Quick&Clean: The SFM Method. In: B. Janiūnaitė & M. Petraite (eds.) Proc. of the 14th European Conference on Knowledge Management ECKM 2013. Sonning Common (UK): ACPI, vol. 1, 44-51.
- Bettoni, M. (2010) Negotiations of Meaning with MOODLE: Concept, Implementation & Experiences. In: B. Ertl (ed.) E-Collaborative Knowledge Construction: Learning from Computer-Supported and Virtual Environments. IGI Global, www.igiglobal.com, Chapter 2, 40-53.
- Bettoni, M. & Schneider, S. (2002) "Experience Management -Lessons Learned from Knowledge Engineering". In: Lecture Notes in Informatics (LNI) Vol P-10, Gesellschaft für Informatik (GI), Bonn, 2002, pp. 117-128
- Eppler, M.J., Burkhard, R. (2004) Knowledge visualization: towards a new discipline and its fields of application. Lugano, Università della Svizzera italiana, Faculty of Communication Sciences, Institute for Corporate Communication.
- Gomez, P. & Probst, G. (1999) Die Praxis des ganzheitlichen Problemlösens. Bern: Paul Haupt Verlag.
- Haberfellner, R. et al. (2002) Systems Engineering, Methodik und Praxis. Zürich: Verlag Industrielle Organisation, 11. Auflage.
- Obeng, E. & Gillet, C. (2008) The Complete Leader - How to lead to results. London, London Business Press
- Kant, I. (1781/1966), Kritik der reinen Vernunft, Riga, 1781; Stuttgart: Reclam, 1966.
- Murdick, R.G., Ross, J. E. & Claggett, J.R. (1999) Information systems for modern management. New Delhi: Prentice Hall of India
- Probst, G., Raub, S. & Romhardt, K. (2021) Wissen managen. Wiesbaden: Springer Gabler.
- Sloan, M.C. (2010). "Aristotle's Nicomachean Ethics as the Original Locus for the Septem Circumstantiae". Classical Philology. 105: 236–251.
- Stocker, A. & Tochtermann, K. (2010) Wissenstransfer mit Wikis und Weblogs. Fallstudien zum erfolgreichen Einsatz von Web 2.0 in Unternehmen. Wiesbaden: Gabler Verlag.
- Ulich, E. (2016) Arbeitssysteme als soziotechnische Systeme. iafob (Hrsg.), Unternehmens-gestaltung im Spannungsfeld von Stabilität und Wandel, Bd. II, vdf ETH Zürich.
- Ulich, E. (2011). Arbeitspsychologie. 7. Auflage. Zürich: vdf Hochschulverlag/Stuttgart: Schäffer Poeschel.