

Decision Support for Location and Facility Planning

Dr. Uwe Jasnoch, Monika Heidemann, Thorsten Schulz

As a consequence of a carefully planned selection and an optimized logistics, a more efficient material flow, an improved customer service, less environmental impact and a better legal certainty could be achieved at lower reorganization and operating costs among other things.

However, location and facility planning is a comprehensive, complex and important process. For this reason, we have developed KogiPlan (acronym for the German terms for »co-operation«, »geographic information system« and »decision support for facility planning«) which will help to make decision making easier and faster as well as more comprehensible and transparent.

For the realization of KogiPlan, the competences of the three project partners: the Fraunhofer Institutes for Autonomous Intelligent Systems (AIS), for Computer Graphics (IGD) and for Industrial Mathematics (ITWM) are combined and expanded. A former version of KogiPlan was already presented at CeBIT 2002. Now the new

and final version (including new features, a better integration of components and an extended scenario to visualize the improvements) will be shown at CeBIT 2003. These improvements will be outlined after a short overview of KogiPlan.

The prototype KogiPlan

Figure 1 shows the entire decision process for location and facility planning. All phases are supported by KogiPlan. The different phases and the corresponding support of KogiPlan will be described in the following outline. In a first step, the task, e.g. »Where is the most suitable site for a recycling plant?«, will be analyzed by the user of KogiPlan. For this aim, more detailed information is necessary, but convenient data providing this information is unusual.

If it is actually available world-wide, a metadata broker can help to find this data. Integrated in the data warehouse, a data mining component can be used to extract information about subgroups, to predict and to estimate

German Abstract

Mit Hilfe von KogiPlan (Kurzform für Kooperation, GIS und Entscheidungsunterstützung bei der Standortplanung) können Entscheidungen im Bereich der Standortplanung transparent, zeitnah und nachvollziehbar getroffen werden. Auf der CeBIT 2003 wird die neueste und endgültige Version von KogiPlan vorgestellt. Alle relevanten Daten werden hier bei der Standortplanung berücksichtigt, Vorschläge auch im Kontext mehrerer alternativer Ansätze als objektive Bewertungskriterien generiert und deren Auswirkungen visualisiert. Neue Features und eine weiterreichende Integration der Komponenten werden im Besonderen an einem speziellen Bankenszenario demonstriert. In KogiPlan werden die speziellen Kompetenzen der Fraunhofer-Institute für Autonome Intelligente Systeme (AIS), für Graphische Datenverarbeitung (IGD) und für Techno- und Wirtschaftsmathematik (ITWM) kombiniert und erweitert. Das Projekt wird vom Bundesministerium für Bildung und Forschung gefördert.

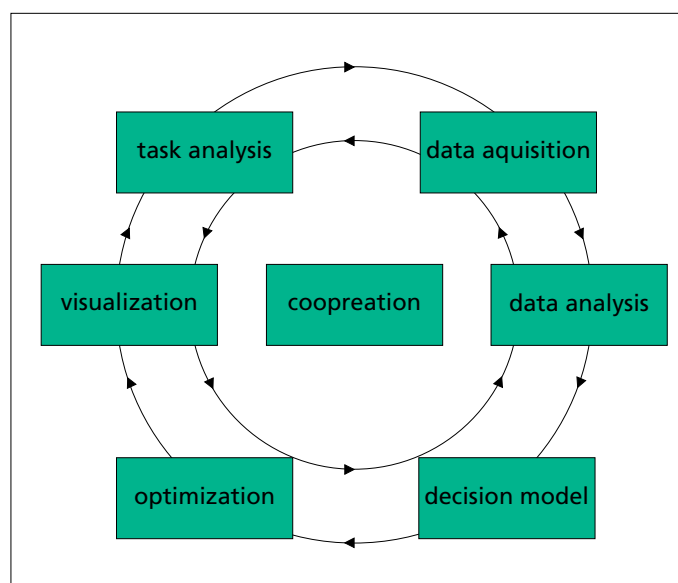


Figure 1: Phases of a location and facility planning process



Figure 2:
An imaginary suggestion of KogiPlan including business competition situation

stored together with comments on the communication component. The detailed documentation of the entire planning process including all important alternatives, decisions and proposed solutions can be found in the corresponding design rationale. Therefore, the process can be reconstructed (transparent solutions) or resumed under modified terms and conditions at any time.

Financing and further information

KogiPlan is promoted by the German Federal Ministry of Education and Research. More Information about KogiPlan can be found at the homepage of KogiPlan: www.kogiplan.de.

the property of data. In this way, it is possible to detect highly relevant information. Additionally, a special geographic information system can be used to evaluate the extracted criteria and set priorities. All results of the location and facility planning process steps, such as relevant criteria, options, decisions, justifications and comments are stored on a communication platform. Thus persons with different backgrounds and management levels are able to participate in the negotiation process.

The qualitative goals, options and constraints of the early phases could be discussed and elaborated into alternative quantitative planning models, which could be optimized by a special optimization component. At a later stage, corresponding results can be visualized by a web-based geographic information system. In this way, the results can easily be presented to the employers, the heads or even the concerned citizens. Without needing to install a proprietary geographic information system, the integration and manipulation of geodata is enabled by using the Internet (e.g. theme layers can be used). By the presentation of geodata and further information the evaluation of the results will be facilitated even for non-experts.

Prior to publication of the results different variants can be computed and visualized interactively in order to investigate different hypotheses or to test the stability and quality of the suggested solution. Instead of drawing

cycles on a map (which is currently often used to determine a solution) the web-based access to a smart user interface of KogiPlan, the support for cooperation, the coverage of different planning phases and the graphical, interactive approach help to find optimal solutions even in combination with complex planning problems where many decision makers are involved.

New Features on CeBIT 2003

The reorganization of a branch network is a very complex planning and decision process, which will be used to demonstrate the features of KogiPlan. A simpler scenario at CeBIT 2002 proved that a wide range of interesting scenarios can be easily deducted and described.

The revised scenario will include the business competition situation and more restrictions, which are defined by a fictitious applicant accounting for customer needs. Thus, the best solution will be found offering an adequate customer service at low fix and follow-up costs (minimum total costs).

The strategic decisions have a long-lasting effect on bank facilities. The new functionalities of KogiPlan provide the above-mentioned and further necessary criteria, a better parameterization and a better integration of all components. KogiPlan can now be adapted easily to new circumstances. Among other things, screenshots can now be generated by simply pressing a button. They can be

Points of contact

Dr. Uwe Jasnoch
Thorsten Schulz
Fraunhofer IGD, Darmstadt,
Germany
Email: uwe.jasnoch@igd.fraunhofer.de
thorsten.schulz@igd.fraunhofer.de