Decision support system (DSS) for disasters based on integrated database – output of possible impacts and recommendations for decision makers

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In spite of the use of the high-automated systems of observation, collection, storage, processing, prognosis and delivery of information of environment, the size of damage increases from the natural disasters. It is related to that information about environment, delivering on industrial enterprises, is effectively not enough used. For the increase of this efficiency, it is possible:

- to organize automatic notification of persons and a decision-making (DM) about arising up natural disasters through software–agent, working on a mobile internet-device;
- to represent information in a compact kind on the screen of computer;
- to estimate a possible damage from natural disasters and expense on preventive actions;
- to give out information about affecting of environment industrial enterprises, population and to recommendation for DM; to present information as interactive maps, graphics, tables.

Tools of the notification of the DM about the arisen natural disasters through the software – agent are working with use of critical values of indicators of natural disasters for each type of enterprise and a technological process. The software–agent is adjusting by the user under concrete object, region, influencing natural disasters.

Information by means of the compact scheme reflecting the environment parameters influencing industrial enterprises in the form of devices (the thermometer, the aneroid, a speedometer) are visualizing with values of the indicators which exceeded critical values.

DM must understand possible impacts from natural disasters and lean on recommendations, given out by the system for decisions support. Delivery of information about possible impacts of natural disasters and recommendations leans on the knowledge, formed on the base of the accumulated experience. The type of information (observing, forecasting, climatic, after the phenomenon), season of year, climatic zone, level of making decision is thus taken into account.

The testing base of critical values are created, the formalized information on impacts and recommendations for natural disasters are collected.

The principles of information dissemination about natural disasters

- **Personalization of information** - only what need at a moment of natural disaster, for a certain enterprise, technological process, management level, region;
- **Mobility** - delivery of information to any mobile internet-device;
- **Automation of delivering of information** about disasters for decision-makers;
- **Automatic using** of information for each object;
- **The formalization** of business processes which define the organization of works to increase the safety of the population and industrial enterprises;
- **Classification** of impacts and recommendations (before, during, after disasters).

The main idea is next. Knowing conditions of the environment is possible define the list of possible impacts on object in advance, knowing impacts, it is possible to define recommendations for acceptance of preventive actions for various levels of objects management in advance.

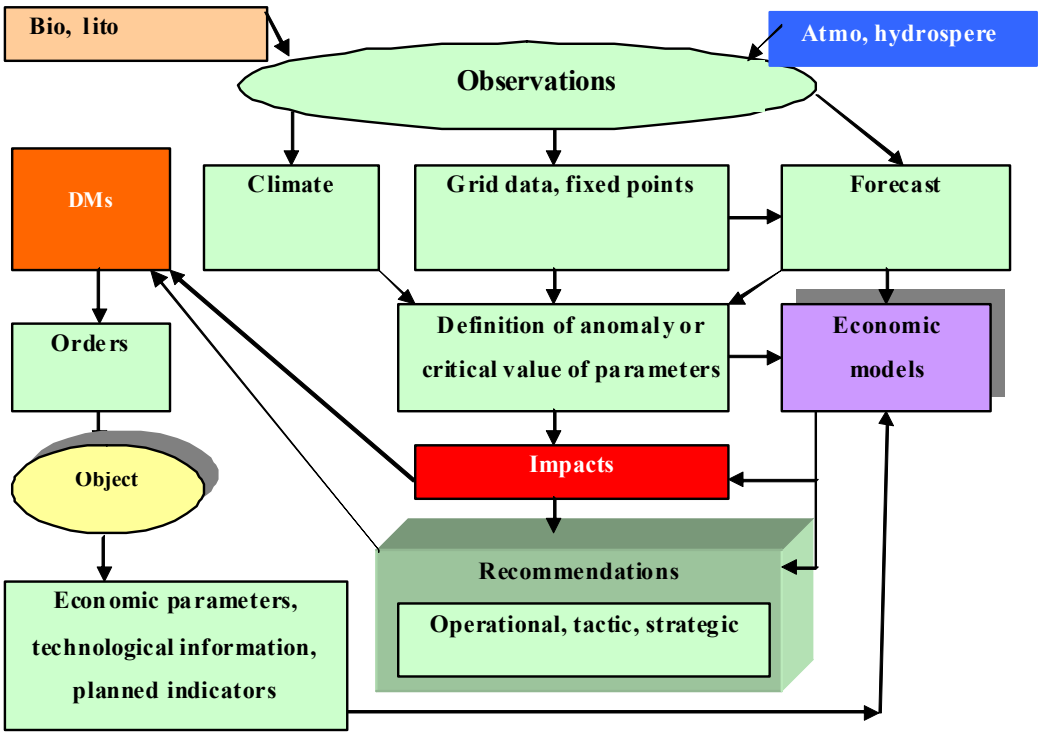

Figure 1: Scheme of supporting of decision maker

For the creation of DSS, the following steps are needed:

- to collect and formalization information on possible impacts and recommendations;
- to develop a database of critical values of environmental parameters for separated objects and technological processes;
- to create of economic models for an assessment of impacts and possible damage, specification of costs on preventive actions.

The knowledge base for decision making is created as tables of impacts and recommendations for natural disasters for different objects, disaster level (disaster level (yellow, orange, red), technological processes, seasons, climate zones. The demonstrational variant of DSS is created for mobile internet device. Automatic detection of natural disasters on the basis of observation and forecast is organized.