INTELLIGENT RECYCLING DATABASE

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In my opinion all countries in the world do not make a proper use of the invention of recycling. Waste materials are not reused and people do not benefit from them. However, there is a hidden energy in scrap materials which is wasted.

That is why I would like to consider an idea of an intelligent recycling database which would deal with searching out and connecting demand and supply for recyclable materials from various companies. The project consists of

- logical databases (PRODUCTION NEEDS and RECYCLABLE MATERIALS)
- a special algotrihm which would work out necessary calculations and estimations
- optimisation and simulation models
- global expert computer information systems which would coordinate transaction from many national systems from the whole world.

That is some scientific facts concerning recycling which prove its advantages:

Aluminium	- Recycling 1 kg of aluminium saves up to 8 kg of bauxite, four kg of chemical products and 14 kW·h of electricity. - It takes 20 times more energy to make aluminum from bauxite ore than using recycled aluminum.
Glass	- A 20% reduction in emissions from glass furnaces and up to 32% reduction in energy usage. - For every 1000 kg of recycled glass used, approx 315 kg of carbon dioxide and 1,200 kg of raw materials are spared.
Paper	- 1000 kg of paper from recycled material conserves about 7,000 US gal (26,000 L) of water, 17-31 trees and 4,000 kW·h of electricity, and reduces the rate of virgin forests being cut to make tree farms. - Milling paper from recycled paper uses 20% less energy than it does to make paper from fresh paper trees grown on tree farms at the cost of more pollution caused by additional transportation and chemical cleaning treatment.

I have hit upon an idea that if there was an effective computer information system which encompasses data from companies all over the whole world, people could take even better advantage of natural resources.

In the first place every company which uses in its production processes natural resources should create a special database where every used ingredient or substance will be catalogued.

Necessary data, for example: kind of material, its quality, quantity used up in the production process should be introduced obligatorily at the beginning. Then special computer system managed by algorithms will process these data. This algorithm will be projected as a tool which will estimate how much recyclable materials come into being after production process.

The waste hierarchy

This algorithm will operate properly after implementing detailed, technical guidelines concerning production technologies.

The next step is that in every region (for example province, state or any kind of teritory) there should be a collective database which will integrate data from all company databases and regional reports:"Home-made rubbish regained resources". In this regional databases a lot of important information will be gathered and cosolidated from companies as well as city centres where rubbish are stored.

The structure of regional database consists of large data sets which will be divided into categories:

- PRODUCTION NEEDS
- RECYCLABLE MATERIALS

There will be two large databases: PRODUCTION NEEDS and RECYCLABLE MATERIALS. Every record in these databases consist of five elements.

- Then the special system should be projected which will deal with searching out suitable and adequate records in both databases which have the same kind of material.
- In the next stage the system checks if the time of appearance of reusable materials is possible to synchronize with the date of demand declared by individual company.
- The following step is that the system measures the distance between the place where waste materials are accumulated and the company which wants to reuse it.
- Then system uses simulating and optimisation methods and models in order to determine the best favourable supply path so as to minimize costs of transportation. The system considers also the time of delivery so as to avoid delays. Then the ranking of the best connctions is made as regards costs and time of delivery.
- And the system makes a first decision to send announcements to both companies about the opportunity to enter into agreement with each other. If one of them turns down the proposal, next decision from the list will be taken and the process starts from the beginning.
- If two partners come to arrangement, they will sign a contract and materials will be delivered from one company to another.
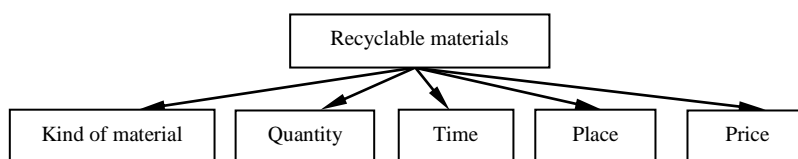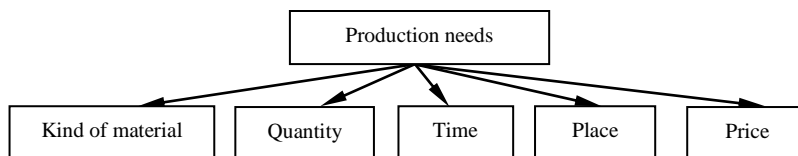
If the regional databases and systems function properly, it would be possible to broaden its range of operation on a large national or even international scale. It would require integreted, well-projected computer information systems which will be managed effectively and without stoppages. The introduction of such systems also would require an enormous sum of financial resources, however, long –term consequences may show that a lot of savings could be done by using recyclable materials and economizing on purchasing new raw materials, fuels and substances.

As far as international system is concerned, it would be particularly wise to exchange information about rare and expensive resources endangered by running low.

For examaple, one national system may six times per day send to all other national systems all around the world a message about up-to-date demand for natural resources, raw materials and

stored recyclable materials. I think that a case when necessary resources may be accumulated as a matter of fact abroad, however, 50 km far away is quite possible. Without the system two companies situated in the border area would not know about a chance to cooperate with each other in this extraordinary way.

To tell tha truth, contemporary companies try to be competitive at any price and cut costs of running the businness as much as possible. They introduce just-in-time systems of delivery and my idea may be hard to reconcile with them. However, big concerns and corporations are able to allocate some of their profits into such systems. In my opinion, they would be a great contribution to environmental protection.