The word "smart", when associated with "grid", is mainly used in the fields of energy and /or water. It could open a complex discussion but, in a few words, it addresses the problem of distribution of resources through a network. When we think about data distribution, as internet, we instead are used to name as a “network”. However, for sake of simplicity, this can be described as a series of "roads" that cross some "nodes", and the main problem is the size of the roads and the traffic management. Whatever, data, electricity or water: the concept is the same.

Probably, the use of the two different words, grid and network, has to do with the fact that in one case the management is mainly from the top, i.e. by who provides the product, and the other is largely dynamic in a reciprocal exchange. As consumers, we receive water, we receive electricity (though some could also generate by themselves), while data in internet are constantly transferred between users and the manager of the net cannot dominate the content of the traffic.
A grid can therefore be meant as a compulsory path that allows/facilitate movement/transfer into a system. But the same system, in principle, could move differently. In this regard, an example is the road system: we, as humans, could move as we prefer by foot, but to increase speed we use cars which need an infrastructure. But a car cannot climb stairs or drive through narrow, drunk driving routes. The grid is a way to optimize some performances, such as speed or costs etc., but rarely allows for flexibility. In turn, flexibility in the grid consists in choosing different roads to get from one point to another, but not getting out of the roads already built. The concept of “smartness” therefore refers to alternative pathways, not to the displacement and sizing of paths (such as electrical wiring or piping) which, once established, do not allow for easily adaptable changes in a short time.

Recently, the concept of “smart grid” is evolving from systems associated to the provision of single "products", such as electricity, water, data, to much more complex systems, such as food. Food is linked to many aspects: nutrition, individual requirements, which changes over the course of life and in terms of activity and geography, community’s requirements in which the individual lives, the ability of a territory to fulfill for the need. This challenge involves public authority, research, industry, individuals, and the environment.

But the big difference between a "food" system and those like water, energy, data is that food is also cross-linked to all the just mentioned, and in addition it has the final consumer tightly bound to the producer: eating habits and the ability of local communities to provide food are interconnected.

A breakthrough innovation in the global food system can realize in transforming the centralized and generalist system, dominated by large producers, to a decentralized and personalized production. The challenge of this transformation lies in the ability to identify and realize a sustainable system of territorial "cells", let’s call them "fundamental units", capable of managing the population's primary needs according to local resources, accompanied by a number of "cell" agreements/links to satisfy the missing ones. The size of a "minimum" cell therefore depends on the number of citizens, their needs and food culture, and the ability to assure what is missing through exchanges with other cells, that might be distant too. This is where the new concept of “smart” comes into play: adaptable to changes, such as droughts, wars, financial crises, environmental disasters, and so on, and capable to change while not bounded by the grid. This smart system might need a system of grids for some of its components (such as energy, water, transport).

Fundamental units need information exchange, as well also exchange of some products: such as cells need to interact with others and are exposed to the environment to keep an organism in equilibrium.
The idea of smart grids for food systems was recently launched, with different interpretations, at a meeting in Capri promoted by the food group of the CNR Foresight Project (http://www.foresight.cnr.it/).
Interestingly, the main issues in addressing this challenge of the "food" group seem to recall those that have been identified in several other foresight groups, such as materials and medicine. These issues are addressing the lack of knowledge in understanding the phenomena of non-equilibrium, context-dependency or interaction with the environment, the extraction of laws and paradigms from data analysis, the continuous transformation of parts while maintaining unchanged the functioning of the whole.