as a matrix, using that to define a space similar to the technological space, in which each point represents a technology with its specific structure of operations, and called *space of technologies*. Such matrices shall of course take account of all types of operations included in all technologies having the same purpose and considered for a defined space of technologies. In this case, differently from the technological space, the Hamming distance among points is defined comparing matrices and not configurations. Such distance in the space of technologies increases with the difference between two technologies and may be considered a measure of the *radical degree* of a new technology compared to a pre-existent technology or alternative new technology. Following a largely used terminology a technology may be considered by the model *radical*, if this distance is great, or *incremental*, if this distance is small. A the same time a technological innovation may be considered radical (drastic) if the change necessary to transform a pre-existing technology into the new technology is great, or incremental (evolutive) if this change is small. In this way the space of technology defined by the model offers a special view of what it has been defined as natural trajectories of technical progress (Nelson, Winter 1977) in the frame of technological paradigms (Dosi 1982). In this space it is possible to represent the appearing with time of new technologies, of incremental or radical nature, depending by their radical degree, in term of points of the space of technologies. In the case of appearance of a new radical technology there will be a transition in the space of technologies, due to the great Hamming distance, from a group of incremental technologies originated possibly by a previous radical technology. In other words when an important radical technology appears in the space of technologies, it follows, as observed by Kauffman and reported in the introduction of the paper, an explosion of creativity generating a high number of dependent incremental technologies and at the same time there is the mass extinction of previous less efficient technologies including technologies that are directly dependent. Such explosion of creativity has been shown indirectly by studying the growth of number of dependent patents from an initial radical invention as in the case of computer tomography (Valverde, Solé, Bedau, Packard 2007).

2.4 Efficiency of technologies

Technology efficiency (fitness) is a complex concept that is difficult to define quantitatively by a unique description. From the practical point of view there are many types of efficiency that may be considered. For example, it is possible to consider energy efficiency of a technology in terms of production of energy but also on the contrary in terms of minimization of its consumption. It is also possible to define an environmental efficiency of a technology in terms, for example, of level of abated pollutants as well as in terms of level of purity, accuracy etc. One of the more important efficiency of a technology concerns its economy and may be expressed in terms of cost of production. From the point of view of the model it is possible to define an overall efficiency of a specific