

Chapter 8

Evaluation of the Length of Hospital Stay through Artificial Neural Networks Based Systems

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ABSTRACT

The mentality of savings and eliminating any kind of outgoing costs is undermining our society and our way of living. Cutting funds from Education to Health is at best delaying the inevitable “Crash” that is foreshadowed. Regarding Health, a major concern, can be described as jeopardize the health of Patients – Reduce of the Length of Hospital. As we all know, Human Health is very sensitive and prone to drastic changes in short spaces of time. Factors like age, sex, their ambient context – house conditions, daily lives – should all be important when deciding how long a specific patient should remain safe in a hospital. In no way, ought this be decided by the economic politics. Logic Programming was used for knowledge representation and reasoning, letting the modeling of the universe of discourse in terms of defective data, information and knowledge. Artificial Neural Networks and Genetic Algorithms were used in order to evaluate and predict how long should a patient remain in the hospital in order to minimize the collateral damage of our government approaches, not forgetting the use of Degree of Confidence to demonstrate how feasible the assessment is.

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1. INTRODUCTION

Over the past few years, the dogma of reducing costs has grown rapidly. We are currently facing a worldwide economic crisis that is affecting every sector of our society. This leads to erroneous behaviors and actions by our leaders, when trying to delay and repeal the possibility of a foreshadowed economic crash. And how do they try to bypass the crash? Reduction of all costs. Sections such as Education, Health, Social Security, etcetera, are being forced to cut down the costs, to counterbalance the lack of funding by the government. In education, schools are closing down, teachers are fired or compelled to lecture more students and to work for more hours, culminating in a diminution of performance in the art of teaching and learning. The same can be applied to Health.

Nowadays, closing health facilities and laying off medical staff are some of the headlines of our lives, both doctors and patients are suffering the consequences of our leader's convictions in reducing costs. None is getting the respect they deserve. Health practitioners are, as well as teachers, enforced to practice extra hours, to reduce the duration of medical evaluations and, last but not the least, to prioritize the health of the institution above the patient health, which ends up in minimizing the length of the patient's stay at the hospital.

Ethically, this view is unacceptable. Objectively, this is happening. In no circumstances, should a medical patient be seen as a number, as a monetary cost. The Hospital must be regarded only as a tool, a place to treat maladies, illness. A Patient's fate must not be decided by arithmetic, but by his health condition, his context, his past and present. These are the only decisive aspects to determine the duration of a sick person in the medical facility. And what is this context?

In the medical universe, the context can be referred as the life story of a patient. In order to make any type of medical judgment, a health professional has to consult all the information on the patient. This information comes from two sources:

- Patient
- Hospital

From the patient, we can obtain age, sex, comorbidities - physiological / morphological features - as well as data related to their daily lives. It is important to note that this information is subjective and may also not correspond to the truth, since we can never confirm the honesty of the patient. The ill-founded can induce the health professional in error through lies or due to memory problems.

The data relative to the Hospital includes all kinds of medical history of the patient: examinations, consultations, cultures and medical journals. It can be said

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