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Human Factor and Artificial Intelligence in Agribusiness

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It is not clear now if we really live in the artificial intelligence era. It is clear machines won't substitute a huge number of workers, just those who would be substituted by automation mechanisms in a process that started already started decades ago.

Artificial intelligence represents a dramatic change in how products and services are being sold in the retailing industry, but not in most industries, even if you think this is what happens in the worldwide industry. It is easy to reckon smartphones and other devices and applications in our homes capture all sounds and conversations trying to identify our preferences and algorithms look for goods and services suitable for you. Algorithms also select what we will read in social media posts and advertisements, propping up behaviours and selling. Plenty of books and documentaries on tv and streaming argue about that. Quite curious how such algorithms do not recommend such a subject to me.

Can you reckon other popular services that use artificial intelligence, or its subset called machine learning? For example, the agribusiness industry sponsors research to create "smart algorithms" focused on optimize resources and field practices. The key difference of this industry compared to retailing is the impact on the crop and the environment.

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Each human being is unique, and the loss of a single one turns the poorer universe (popular expression missing me the author’s name). However, it is not the way the marketing companies evaluate us. In this case, we are not so different from each other, and we do not change as fast as we suppose. For decades marketing tools categorize us in predefined profiles, and with the vast amount of available data about us concentrated in few businesses, the conditions to apply algorithms are perfect. More data, consequently more accurate the algorithm is. If some suggested product is not good, a hot sale may mitigate losses. Good discussions about ethics and current society can be read in “The Burnout Society” by Byung-Chul Han and “Why we’re polarized" by Ezra Klein.

In the industrial processes, including agribusiness, inconsistent decision-making may cause tremendous losses for industrials and growers. Impacts in the market may be relevant. The industry knows that, and even be eager to apply machine learning in process optimizations, it must be cautious. One key issue in the research subject I work in recent years in agribusiness becomes hard the application of algorithms: the weather and its changes. The consequence is algorithms failed for several scenarios. However, they also help growers to get better results in many other application scenarios.

The current studies are about irrigation in Australian farms. We use sensors, satellite imagery, and automated irrigation devices. The sensors monitor the crop water usage, and satellite imagery allows us to estimate several

crop parameters, including the evapotranspiration for the next week. With such data, we can estimate the moment of the next irrigation event. The algorithms calculate a multitude of parameters and warn the grower about when to irrigate. After a human decision, based on the algorithm estimations, other algorithms control the irrigation event.

The algorithms are saving labour work and water, as growers do not need employees driving along the crop bays to evaluate irrigation is going well or not. Savings bring a fast return of investments than estimated previously. Algorithms help not only in irrigation but also in other issues. Every day more mathematical models support growers in the logistics of crop harvesting in intensive crops such as sugar cane or even have better geometries to spread seeds, increasing the crop density. We must have more systematic data harvesting to be able to represent the crop dynamics better. The equipment costs are decreasing dramatically, but the drawback still is (as usual) to have professionals ready to deal with the needs of the industry.

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Any professional who wants to work in agribusiness must deal with the complexity of crops and the business. You must be dirty with mud, and you must not believe that you will find a kind of Jeca Tatu (such a stupid idea). For a very long time, agriculture is not seeding something and pray to God for rain. It is not what you will find in the industry and exists mainly in the marvellous book **Vidas Secas** from Graciliano Ramos, a dreadful description of the family struggle against poverty and desolation (one of my saddest memories is the destiny of Baleia). Anyone who wonders to work in any industry must have clear you are to serve the business with your knowledge, but not to tell what to do or what technology they need to use. You must have clear in your mind that you don't know anything about the business compared to those who deal with production or business. The computer specialist must try to understand, as best as he can, the real needs and choose the strategies and technologies that best fit and maximize the investment return. More artificial intelligence, cloud, or fog is not the question. The real issue is productivity respecting the environment.

Don't be silly neglecting the environmental questions. This subject has a tremendous impact on the global acceptance of the products and also have production issues. In the end, the human factor is the key to promote the usage and results of technology in agribusiness.

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This article is a result of the author's ascertainment and analysis, without compulsorily reflecting CEST's opinion.