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Data Science in Engineering Technology

In the ever-changing field of engineering technology, the importance of data-science is more crucial to success now more than ever.

Research has shown that data science is needed not just for an organization to remain competitive in their field, but also to survive. It is no longer enough to simply store and analyze data. Engineers must practice relating their data to the analysis of their organizational processes. Data science has been shown to close the gap between traditional model-based process analysis such as simulation and data-centric analysis technique such as machine learning and data mining. This can provide benefits in several areas and be applied to any type of operational processes and systems. Some examples of how data science can be implemented in organizations include: analyzing organizational processes, improving customer service processes, providing a better understanding of customer behavior, analyzing failures, and improving the user interface of equipment. A principal trait that all these different forms of data science applications have in common is that “dynamic behavior needs to be related to process models” which is referred to as “data science in action.” Additionally, it has been found that there are several data science approaches that support decision making and business process design and redesign. This gives organizations the flexibility to adopt the data science approaches and technologies that best suit their specific needs. This can help organizations address the classical divide between “business”

and “IT” as it helps to create a common ground for business process improvement and information systems development.

When it comes specifically to data science as it applies to the field of engineering, it has become well-known that data science is a fundamental component of the field. Research has shown that data-science is critical to the validation and progress of engineering technology. There are two main points to this argument: 1) data science serves as evidence to support scientific inquiry, and 2) data science makes a social contribution to the establishment of and maintenance of communities of practice. We can see these two arguments in effect when it comes to engineering models. Using data science, modelers are able to validate their models which leads to advanced theories. Experimentalists, in turn, can benefit from the theories enabled by these models. Furthermore, many engineering disciplines work with tasks that have a high degree of uncertainty and utilizing data science is a proven method for addressing this uncertainty. However, it should be noted that engineers using data science in their practice must ensure that they have a clear understanding of: 1) the nature of the data itself, 2) the scientific purpose of its collection, and 3) its social function in the community that created it. Finally, it is important to note that the field of data science is a relatively new field, and, just like the field of engineering, it will continue to evolve over time. New advances in data collection and aggregation will continue to emerge. As the field grows and projects involve more people, places, and things, data sets will also grow. This means that responsibility for data will become diffused, and the social norms surrounding how data is produced and consumed will change. While the data used in engineering projects is crucial to their success, engineers and data scientists need to ensure they are protecting the privacy of the individuals whose data they use and take in active role in privacy conversations.

Works Cited

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