Method for managing drilling process at oil and gas fields involves collecting data using sensors that measure drilling parameters of drilling components. Data is transmitted in real time via two-way communication to control system. Under the control of central computing module, sensor applications normalize the received data. Request is sent to process applications, which generate drilling parameter instructions; these instructions are then prioritized by the priority planning controller based on the priority plan. Instructions are selected and sent to drilling component controllers. Using central computing module, equipped with agent-based artificial intelligence running on processor, additional processing of the normalized data is performed, consisting of identifying correlation clusters in multidimensional space and creating a machine-learned ranking of importance weights for each attribute from a set of attributes selected from the normalized data, to obtain weight coefficients. Weight coefficients of attribute importance are ranked. Patterns in technological parameters are identified in real time based on the analysis of correlation clusters in multidimensional space. Predictive and prescriptive optimization of normalized data is performed in accordance with the ranking of attribute importance weight coefficients and the identified patterns in process parameters. Transfer of processed data and generated drilling parameter instructions is ensured to cloud environment with distributed infrastructure.