A Software Process Model (SPM) formalizes the best practices in executing some kind of software related activity; Process Centered Software Engineering Environments (PSEEs) animate SPMs in order to guide process agents, the people that execute the process. Since flawless process executions are unrealistic, it is important to be able to handle situations in which the process, as executed by the process agents is not consistent with the process, as specified by the SPM. We call these situations deviations. The state of the art in handling such situations consists in; provided that a deviation has been detected; allowing the choice between one of the following two options: aborting or ignoring it. The main objective of this thesis is extending this state of the art by allowing PSEEs to guide process agents more effectively when they deviate. This objective includes investigating the causes of a given deviation (diagnosis) and the risks involved in each of them and which are the possible ways to bring the process agent back to normality (handling).