Chapter 1 : Swiss cheese model - Wikipedia

They are categorized according to the cognitive processes involved towards the goal of the action and according to whether they are related to planning or execution of the activity. Description Actions by human operators can fail to achieve their goal in two different ways: The actions can go as planned, but the plan can be inadequate, or the plan can be satisfactory, but the performance can still be deficient Hollnagel, Errors can be broadly distinguished in two categories: Category 1 - A person intends to carry out an action, the action is appropriate, carries it out incorrectly, and the desired goal is not achieved. Execution errors are called Slips and Lapses. Slips relate to observable actions and are commonly associated with attentional or perceptual failures. Lapses are more internal events and generally involve failures of memory. Category 2 - A person intends to carry out an action, does so correctly, the action is inappropriate, and the desired goal is not achieved - A planning failure has occurred. Planning failures are Mistakes. At this level, they can commit skill-based errors slips or lapses. This distinction, between being done incorrectly or not at all, is another important discriminator. When the appropriate action is carried out incorrectly, the error is classified as a slip. When the action is simply omitted or not carried out, the error is termed a lapse. In contrast to attention failures slips , memory failures lapses often appear as omitted items in a checklist, place losing, or forgotten intentions. Likewise, it is not difficult to imagine that when under stress during in-flight emergencies, critical steps in emergency procedures can be missed. However, even when not particularly stressed, individuals have forgotten to set the flaps on approach or lower the landing gear. Mistakes Once a situation is recognised as unfamiliar, performance shifts from a skill-based to a rule-based level. First of all, the human tries to solve the problem by relying on a set of memorised rules and can commit rule-based mistakes. These kinds of error depend on the application of a good rule a rule that has been successfully used in the past to a wrong situation, or on the application of a wrong rule. The goal or plan was wrong. This type of error is referred to as a mistake. When we recognise that the current situation does not fit with any rule stored, we shift to knowledge-based behaviour. At the knowledge-based behaviour level we can commit planning errors Knowledge based mistakes. They basically concern the difficulty we have in gathering information on all the aspects of a situation, in analysing all the data and in deriving the right decision. Planning is based on limited information, it is carried out with limited time resources and cognitive resources and it can result in a failure. Example of mistake Imagine the following situation. The traffic is not moving at the usual pace and at some points it is not moving at all. You do not know what is happening: In response, you devise an alternative plan: You know the city, so it is easy for you. Unfortunately, road works make your brilliant plan a failure. The street you intended to use is blocked and you have to return to your usual route. It is possible that the road works on the alternate route were the cause of the traffic jam you encountered. Your plan was wrong. You did not have a good model of the city traffic. The important point to understand is that error and performance are both merely the outcomes of behaviours and actions - these behaviours and actions are intrinsically the same, whether they result in a positive or a negative outcome. A true model of error must therefore be able to account for performance and vice versa HERA. Error detection and correction Effectiveness of self-detection of errors: Including correction tells a different story: