This rigorous thesis analyses use of information and information systems in military operations. The objective is to explain importance of information operations (information and information systems) in military campaigns and peace missions, clarify and analyse their contribution to contemporary and future security operations. Thesis first examines a relation of both Information science and Military science. It further discusses their slightly different approach to information. Next, thesis explains the term information warfare with all possible impacts on an opponent. Thesis continues with comprehensive description and analysis of principles of deception and disinformation. Moreover it gives various examples of use of these techniques in real operations. Then it discusses the current typology of information operations and analyses the IO types. Thesis further describes the IO planning process with an emphasis on its main steps. Afterwards it highlights historical examples of IOs in well-known armed conflicts. Then, examples and analysis of use and success of IO in contemporary military campaigns follow. Further it looks into the problem of the IO deployment at war on terror. The author perceives the necessity of appropriate defence measures against the possible IO attacks as well and therefore concentrates on this topic in a special chapter. The author also believes that the importance of IO cannot be fully understood without a brief examination of IO in the future and comes out with his own ideas about the possible IO development. The study presents use of information and information systems as a result of military art and science of war. The significance of information and information systems grows so rapidly that they could once become new criteria for comparison of armed forces.