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This thesis covers topics related to the significance of information and the role it plays in the ongoing fourth industrial revolution. Its main aim is an attempt to create recommendations facilitating the choice of an integration approach to fit the needs of the company. The author presents new technologies typical of Industry 4.0 and the directions of their further development (with the emphasis on technologies used to collect, process and exchange data). The issues concerning information systems which are part of deliberations on integration of applications and the integration process itself were discussed. The existing typologies of information systems were characterized. The chosen definitions of integrated systems were quoted with regard to the changing environment and their technological capabilities. The influence of these systems on the functioning organisations and their defined roles was described. The course of the integration process was described as well as the significance of such integration for the organisation. The opportunities and threats for companies intent on the implementation of this process were indicated. The existing integration methods were identified as well as their impact on the companies involved. These methods form the grounds for the isolation of architectural approaches in the integration process, which constitute the key elements in the light of the practical part.

The research and practical part includes the results of a survey addressed to specialists in the field of integration systems and concerning the capabilities and limitations of solutions available on the market of integration architecture. The following integrative approaches were analysed: integration by means of the shared data base, publish-subscribe, enterprise service bus and point-to-point. The study was conducted with regard to the size of the company intent on the implementation of integration solution. Also, the thesis includes the analysis of a case of the course of implementation of the recommended integration architecture in a real company. The summary contains conclusions of the research done. They include identification of the needs and threats connected with each of the discussed information architectures, which may be used in the process of making decisions about the choice of integration architecture by companies involved in such a venture.