There is a lot of scope for active research that can be conducted by the simulation and component based software engineering communities for development of technologies for building complex systems by combining the existing components. Future of the software engineering belongs to Component Based Software Engineering. Market is flooded with the demand for reusable quality software components. It has become a strategic imperative in many markets, especially software industry, to bring new components into the market faster. Lot of attention is being focused on the techniques purported to bring components to the market more quickly. Cost, competitive price and quality are the other factors that need to be taken care of. Advancements in these research areas offer both the communities a number of benefits. These include reduced development time and the ability to explore a wider range of design alternatives by adding and removing components from existing software systems.

For the contemporary research work on Component Based Software Engineering (CBSE) and application of Modelling and Simulation in CBSE, Chapter 2 can be referred. This research work was focussed on use of simulation and modelling in reliability estimation, identification of critical components, efforts estimation, requirement implementation and defect removal in component based software systems. But still a lot needs to be explored as far as use of modelling and simulation in component based software engineering processes and use of well-established software engineering practices in modelling and simulation experiments is concerned. There are certain other areas and issues that require research efforts and need to be explored. These include Component based development of grid applications in grid computing, complexity of reusable components in grid and clusters, failure of reusable components in certain applications
particularly in the modern grid and cluster applications, suitability of grid computing for supporting the distributed execution of component based applications, scope of component based development of cloud architectures, reasons for success and failure of reusable components in different kind of applications, maintainability of reusable components, component’s performance in diverse situations, time estimation for development of software components and their integration, optimization of cost and schedule of software component development and integration, Performance evaluation of software components on various platforms.

So the work can be extended to design static/dynamic stochastic simulators for abovementioned areas of research by way of choosing appropriate probability distribution functions for deriving the input data depending upon the environment in which the proposed system shall have to be used so that uncertainties during the process of component development and integration in diverse kind of applications can be managed. Simulators can be designed to draw inferences for reusability, maintainability, quality, time estimation, complexity, performance of software components and software applications using Weibull, Cauchy, Lognormal, Geometric, Gamma, Rice, Rosin Rammler, skellman, triangular and Bolzzman etc. probability distribution functions. Researchers, academicians and industry can collaborate together for the study and development of such simulators that can be helpful to the component based software engineering community in all aspects for times to come so that resources can be optimized to achieve the specified targets on time.