***ITSE:ASSIGNMENT # 01***

***OBJECTIVE:***

Estimate a case study for the process models studied in Chapter # 2 and Chapter # 3 with the following classification(s) i.e. :

a. Locate that the case study(ies) taken / referred should be between the years 2021 and 2024 (current month / date), the case study(ies) could be more than one document and must be enclosed / included in the assignment with complete references mentioned on top of the desired document as heading

***1.Waterfall&Agile Model:-***

***Link:-*** [(PDF) A Comparative Case Study of Waterfall and Agile Management (researchgate.net)](https://www.researchgate.net/publication/359538977_A_Comparative_Case_Study_of_Waterfall_and_Agile_Management)

***Case study :-***

♣ Case Study This case study is concerning the insurance company in Saudi Arabia, which is real. The company owns 300 employees working in that company with an essential role in delivering the projects. The company comes in the top 5 insuring companies working locally. The company offers many types of insurance for a single person or a corporate level. The waterfall strategy brings challenges and problems for the company like delay in the project delivery, impossibility to understand the requirements, failure in the end result which causes to hold the project or rearrange it, the requirements or coding is stable and cannot be changed and is not able to fix the issues. The stages of a project may take too much time to complete it. Therefore, the company decided to implement new methods and objectives in 2020. The method includes updates from the waterfall approach to an agile approach; for example, the team and project's size, the project requirements and necessities, the company's reliability, and changes which is requested by the product owner at the time of working on the project. It can be a challenge for the entire company to change Waterfall to agile because the change in the way of working is also necessary when conducting the different projects from all departments and sections, especially for the IT department, which owns all the projects and is responsible for delivering it on time. The company can change Waterfall to agile for providing a better project. Learning and training may help the employees adopt the agile method, leading to underline the change of thinking. The team can be focused on the advantages and how the company can involve the project owner, who confirms that every task gets the deserved attention and offer to market quickly. The agile method may be beneficial when the communication between the project participants is regular, giving a clear message or understanding of the project.

***3. Concurrent Model:-***

**LINK:** [(PDF) Concurrent Engineering Model for the Implementation of New Products in the Textile Industry: A Case Study (researchgate.net)](https://www.researchgate.net/publication/350928781_Concurrent_Engineering_Model_for_the_Implementation_of_New_Products_in_the_Textile_Industry_A_Case_Study)

**Case Study:-**

Case Study This study was carried out for a textile maquiladora enterprise that works under the SE system. Every time the enterprise makes a new product, each department acts as an independent phase in the process, without interaction between them until shipment to the client. This way of working has caused high rejection rates in the products due to delays, overuse of materials, not very robust designs, lack of raw materials, high price quotes, and project saturation, among other problems. The lack of an adequate process for the development and implementation of new products generates considerable losses. Zhu et al. [18] reported that approximately 70% of product recalls were traced to product development shortcomings. In this enterprise, the rate of rejection of the implementation is close to 75%. The production costs increase due to adjustments in the design and processes to meet production on the customer’s date. The lack of follow-up to new products’ implementation processes generates slight effectiveness in the enterprise’s operations. The apparent similarity between the products leads to complete development being downplayed. This situation provokes short development times, untimely product delivery dates, highly complex construction products, and problems not anticipated in the design phase.

***4. V Model:-***

**LINK:-**[Applying the V Model and Axiomatic Design in the Domain of IT Architecture Practice (sciencedirectassets.com)](https://pdf.sciencedirectassets.com/282173/1-s2.0-S2212827115X00102/1-s2.0-S2212827115007945/main.pdf?X-Amz-Security-Token=IQoJb3JpZ2luX2VjEGcaCXVzLWVhc3QtMSJHMEUCIQCrf%2BQm6BwpsTYSvzz6omAoKMkhX5hFKANvIzECzzWBEwIgLN9dvgwIGuW%2BW%2F%2BNzMPCBFvi4gY58bcb1NHdGFCz9sEqvAUIwP%2F%2F%2F%2F%2F%2F%2F%2F%2F%2FARAFGgwwNTkwMDM1NDY4NjUiDCt1ccmrBrtHF71jASqQBdTRPfNu4tRpAuvqX9APlaojVHq8ieZTB5sncy3PNwe0BtMe%2Bpy3euIBGQvITy6TSnJVJh1kwT%2B6XeifK068UaX%2BoYyGrpe9VHkiy4otZ%2FTBKp8g1siErBA7Ix3HzcFwV%2BKzxlj987ANYSiLsgf84KC95AmbXnqz%2BpP5Rc3F0YrjHI6GJlb0GOm90oX637kmjSxUv5QfjczWG%2BwHt3V85n83WqhNzmxm%2BUVpcW8bDdDXUUyftVT1qeiihSZ8sD6ISeOGZml8NRzZSL02XLAYqkTaOKGlTz55Vyfct5a7r1Io9gJsZh8%2BaK6C4w0eIRvcXBZENMK92gaphqq3cUP7kvpwSQBbCKS9tIe3n3q77AAqvU9oFMn15TkFYbdeMI2f0mNUJLGIcj%2Ba2Nlz%2BE8SWunQo9DKrUjbgTfvcZoVJtWyweeTCLBPgDKaF1OXujPRLCQPhS3CjxWfqFErBnCc1%2FNaxHkYfVjmYLXHOVVxWHrVoPSZ88KOODk1qTsXXeiRO7fRqzl8bbJAB1s%2B4FBEzSnTapBHHo8kgzeOO4foa5LFTwj%2B5%2FQrb1tS2pRRSkQ586EFqWCRm8NtXAkxfY3gBSPWo5kJ6I6yWu8mOtDnKYS6NK46PfD0FYxa2qX1TETS0iHSQkvTwMKuMSqKC9kS1aVEopepUvw%2F7MQjCWQD84lU7kr9EJvE0IfFGnLFrJnH%2FXX%2FrkylEurhhkD%2FsNbkyzuDtnYsUzB73blpYuNnEUNM3a%2Fz9x03Z%2BVYFCRR5z4Ot6v0P2%2BpPfH%2F3axHhFLKNKdjFmRctddMeMZ0f98L1iYvVH%2FKKuROT%2FQnMO8xyMKCpq7UfNab0ZqYkgK2aX2MZQnQxKN5LM135tHhDxwbvm4nMKPf47EGOrEBFXlOoIuQ6geVeUGb%2BBZBmRNop2lItJSl2kHgRasG1ypRz7LxwejTAalpm9f%2BktIF%2FiKXRUCn%2B045q16H38nRT8L5pUE%2FJQ53C0ZHabtTEatQ0ov9OGkCUHqLwddfI3qEKhy8c%2BCx1xgKsXB62vL7y3u61QKK9IAVpYU5PVO%2BewKJuokj5xKBjbYQBe2Y247B%2BF8%2BAV91baITI46KOwzgdIXymzpMV7TvrtJ3E3XvD4dh&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20240506T154454Z&X-Amz-SignedHeaders=host&X-Amz-Expires=299&X-Amz-Credential=ASIAQ3PHCVTYX2ZHR4WH%2F20240506%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Signature=c730a05d3d2c10b8611ce27569ab2c0feb97d3daa4d7c5a985a09a3afba9315c&hash=88ea51d82d9caca95685926663e27e9b9e9ec1369898d1d2ff9adcfb5ecf85d3&host=68042c943591013ac2b2430a89b270f6af2c76d8dfd086a07176afe7c76c2c61&pii=S2212827115007945&tid=spdf-9caee5ad-a363-44d6-a66d-f8fe43f574d6&sid=62337c4b703e3140bc7b227-cace6bdd83a4gxrqb&type=client&tsoh=d3d3LnNjaWV)

**Case Study:-**

The case organisations were all in the process of reorganizing the core business, the care process, due to changes in governmental regulations, changing vision on health care and a more central role of the patient in the interaction with medical personnel. They have an IT infrastructure in operation that functions sufficiently for the current requirements. The board of directors in all three cases wanted to re-evaluate the IT systems in the light of new requirements. The researchers collaborated with the IT architects or with the IT department. The models were developed iteratively. Models that “were interesting” led to more versions, sometimes up to 10 versions. Models that had no relevance to the practice of the architects were abandoned after one or two versions. The rules for checking consistency of models were formulated in natural language by the IT architects and formalized by the researchers.

***5. SPIRAL Model:-***

**LINK:-** [(PDF) REVIEW OF THE SPIRAL MODEL AND ITS APPLICATIONS (researchgate.net)](https://www.researchgate.net/publication/354201473_REVIEW_OF_THE_SPIRAL_MODEL_AND_ITS_APPLICATIONS)

**Case Study:-**

Due to the rapid economic development the problems of transportation become serious especially in developing countries. Intelligent Transportation System (ITS). Modern techniques like transduce, computer and information technologies can combine to provide an error-free, well organized and real time management. Intelligent transportation systems strive for the improvement of efficacy, harmlessness of transportation, ecological environment and use of energy by making humans, vehicles, and roads common. The largest cardinal system of the Intelligent Transportation system is the ATMS i.e Advanced traffic management system, which uses deployment, computer and Information Technology to provide sensitive knowledge to system admins to increase vehicle performance and safety and reduce traffic congestion and pollution. Because of the swift changes in the process of designing and scheming, intelligent transportation system application, a modern model which is called a spiral model, is used in order to beat the disadvantages of the conventional waterfall model. This model allows us to assist in any suitable integration of simulation guidance, focus on placement, focus on automated transformation, or other approach to system development that proves to be beneficial. This feature can be used for flexible scenarios in the construction process while developing its ITS systems.

***6. INCREMENTAL Model:-***

**LINK:-** [Augmented Analytics and How It Can Help - Plutora](https://www.plutora.com/blog/incremental-model-what-and-how-to-implement-it)

**Case Study:-**

the Linux operating system's kernel, the system's core, was developed incrementally, with each new version building on the previous one, using an incremental approach. This allowed the developers to quickly add new features and functionality to the kernel, and to respond to bugs and other issues promptly. Due to this, Linux has become one of the most widely used and well-respected operating systems on the planet.

Microsoft uses incremental models to make changes to its products on a regular basis to respond to consumer needs. These products come in a variety of versions that are updated as user needs change.

***7. SCRUM Model:-***

**LINK:-** [Formula Students used Scrum and Kanban to build race car. (conceptsandbeyond.com)](https://conceptsandbeyond.com/scrum-case-study-formula-students/)

**Case Study:-** Most of the case studies we discussed went through how companies effectively use scrum to develop products. This case study is particularly exciting since a student team called “Blue Flash” used Scrum and Kanban to build a race car for the annual international competition.

Blue Flash Mobility Concepts is part of the University of Applied Science and Arts Hildesheim/ Holzminden/ Göttingen. Every year a team of students participates in the [Formula Student Germany (FCG)competition](https://www.formulastudent.de/about/concept/). It’s a competition between teams around the world where students build formula cars. It is not the fastest car that wins the international design competition, but also about the best construction, performance, finance, and sales planning.

***8. CRYSTAL CLEAR Model:-***

**LINK:-** [(PDF) A Reliable Hybrid Software Development Model: CRUP (Crystal Clear & RUP) (researchgate.net)](https://www.researchgate.net/publication/353267939_A_Reliable_Hybrid_Software_Development_Model_CRUP_Crystal_Clear_RUP)

**Case Study:-**

To achieve the objectives of this study, a Case Study was selected based on the required conditions. The Case Study company consisted of the required software experts. Most of the experts had BSc in software engineering, and some others had MSc. in software engineering or information technology. They had enough experience in using the RUP method and Agile methods. Also, the authors held a workshop to introduce the CryStal Clear process. It should be noted that the team members showed their passion for participating in novel research work.

***9. EXTREME PROGRAMMING Model:-***

**LINK:-** [Exascale programing models for extreme data processing | Proceedings of the 20th ACM International Conference on Computing Frontiers](https://dl.acm.org/doi/10.1145/3587135.3592173)

**Case Study:-**

Extreme Data is an incarnation of Big Data concept distinguished by the massive amounts of data that must be queried, communicated and analysed in (near) real-time by using a very large number of memory/storage elements and Exascale computing systems. Immediate examples are the scientific data produced at a rate of hundreds of gigabits-per-second that must be stored, filtered and analysed, the millions of images per day that must be mined/analyzed in parallel, the one billion of social data posts queried in real-time on an in-memory components database. Traditional disks or commercial storage cannot handle nowadays the extreme scale of such application data. Following the need of improvement of current concepts and technologies, ASPIDE's activities focus on data-intensive applications running on systems composed of up to millions of computing elements (Exascale systems). Practical results will include the methodology and software prototypes that will be designed and used to implement Exascale applications.

The ASPIDE project contributed with the definition of a new programming paradigms, APIs, runtime tools and methodologies for expressing data-intensive tasks on Exascale systems, which can pave the way for the exploitation of massive parallelism over a simplified model of the system architecture, promoting high performance and efficiency, and offering powerful operations and mechanisms for processing extreme data sources at high speed and/or real-time. This work is continued now in the ADMIRE EuroHPC project.

***10. PROTOTYPINGModel:-***

**LINK:-** [A Model of Software Prototyping based on a Systematic Map | Proceedings of the 15th ACM / IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM)](https://dl.acm.org/doi/10.1145/3475716.3475772)

**Case Study:-**

Prototyping is an established practice for user interface design and for requirements engineering within agile software development, even so there is a lack of theory on prototyping. Aims: The main research objective is to provide a means to categorise prototyping instances, in order to enable comparison and reflection of prototyping practices. Method: We have performed a systematic mapping study of methodological aspects of prototyping consisting of thirty-three primary studies upon which we designed a model of prototyping that was validated through a focus group at a case company. Results: Our model consists of four aspects of prototyping, namely purpose, prototype scope, prototype use, and exploration strategy. This model supported the focus group participants in discussing prototyping practices by considering concrete prototyping instances in terms of the concepts provided by our model. Conclusions: The model can be used to categorise prototyping instances and can support practitioners in reflecting on their prototyping practices. Our study provides a starting point for further research on prototyping and into how the practice can be applied more cost-effectively to elicit, validate, and communicate requirements.

***11. UNIFIED DATA Model:-***

**LINK:-** [Establishment of a unified data model based on OPC UA and analysis of the efficiency of communication protocol | Proceedings of the 2021 5th International Conference on Electronic Information Technology and Computer Engineering (acm.org)](https://dl.acm.org/doi/10.1145/3501409.3501500)

**Case Study:-**

In the field of information and communication, data model is used to describe the data organization form of information. It is the pilot work to establish the corresponding database. In Space Environment Simulation and Research Infrastructure, the form of data is various. This article first analyzes the data needs to be collected and a unified data model for monitoring based on the Space Environment Simulation and Research Infrastructure is established; Secondly, the adaptability of the unified data model to the Space Environment Simulation and Research Infrastructure was analyzed and the data conversion plan of the non-unified data model was designed; Finally, UaModeler is used to model the constructed unified data model for OPC UA information, and the communication protocol efficiency is calculated according to the OPC UA communication protocol mapping process. The results show that the model has good scalability and versatility. The data carried by the model can provide effective support for the experimental monitoring function of the Space Environment Simulation and Research Infrastructure. The OPC UA protocol can further realize the interoperability between devices on the basis of the use of a unified data model, and has a higher efficiency in multi-data transmission with a small amount of data, and meets the communication requirements of the Space Environment Simulation and Research Infrastructure.

***12. ADAPTIVE SOFTWARE DEVELOPMENT DATA Model:-***

**LINK:-** [Accelerating Software Development Using Generative AI: ChatGPT Case Study | Proceedings of the 17th Innovations in Software Engineering Conference (acm.org)](https://dl.acm.org/doi/10.1145/3641399.3641403)

**Case Study:-**

The Software Development Life Cycle (SDLC) comprises multiple phases, each requiring Subject Matter Experts (SMEs) with phase-specific skills. The efficacy and quality of deliverables of each phase are skill dependent. In recent times, Generative AI techniques, including Large-scale Language Models (LLMs) like GPT, have become significant players in software engineering. These models, trained on extensive text data, can offer valuable contributions to software development. Interacting with LLMs involves feeding prompts with the context information and guiding the generation of textual responses. The quality of the response is dependent on the quality of the prompt given. This paper proposes a systematic prompting approach based on meta-model concepts for SDLC phases. The approach is validated using ChatGPT for small but complex business application development. We share the approach and our experience, learnings, benefits obtained, and the challenges encountered while applying the approach using ChatGPT. Our experience indicates that Generative AI techniques, such as ChatGPT, have the potential to reduce the skills barrier and accelerate software development substantially.

***13. FEATURE DRIVEN DEVELOPMENT Model:-***

**LINK:-** [(PDF) Selection of Feature Driven Development (FDD) Model in Agile Method for Developing Information System of Mosque Management (researchgate.net)](https://www.researchgate.net/publication/362273636_Selection_of_Feature_Driven_Development_FDD_Model_in_Agile_Method_for_Developing_Information_System_of_Mosque_Management)

**Case Study:-**

This paper discusses software development for building a project using the Feature Driven Development (FDD) model contained in the agile method. As in other agile methods, the Feature Driven Development model has additional properties to implement functions and needs in a short iteration. In terms of the characteristics contained in several other agile models, almost all of them have similarities, which makes the stakeholder confused in determining which model will be chosen as a software development method. This study focuses on the search for a number of suitable project specifications in the selection of Feature Driven Development models for software development. From the research that has been done in several papers, several aspects of design and construction in software development emphasize the quality and high level of features in developing software using the Feature Driven Development model. In facilitating the results of the Feature Driven Development model, we will provide a case study of the Mosque Management Information System which has several features, such as content management, information on prayer time, online reading Qur'an, and Petty Cash Mosque management. The Feature Driven Development model implements this case with a short iteration because this project had done in several months.

***14. DYNAMIC SYSTEM DEVELOPMENT METHOD Model:-***

**LINK:-** [(PDF) Selection of Feature Driven Development (FDD) Model in Agile Method for Developing Information System of Mosque Management (researchgate.net)](https://www.researchgate.net/publication/362273636_Selection_of_Feature_Driven_Development_FDD_Model_in_Agile_Method_for_Developing_Information_System_of_Mosque_Management)

**Case Study:-**

The present study aims to develop a software tool for improvement tracking system for a waste management company in Indonesia. The tool was built as a system to track the improvement process of following up findings of the validation and verification process in the management system of the company. The company also obtains a few audits by the authorities, certification bodies, and its customers. The company applied several management systems in assuring all persons in charges are responsible for following up on the improvement findings. The outcome of the study is a proven software tool that has supported the top management in making decisions in terms of the improvement processes. The system automatically reports to the top management when the findings of each individual responsible person have not been executed yet as well as the top management can take direct decisions and actions to the current status of their improvements processes.