

**Modern Optimized Transportation Solutions for Public Transport Using Agile Methodology**

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**Abstract**

Agile approaches are typically used in software development to help businesses respond to unpredictability. Agile methodology is described as “iterative” and “incremental.” In an agile paradigm, every aspect of development — requirements, design, etc. — is continually revisited. Agile empowers teams to continuously re-plan their release to optimize its value throughout development, allowing them to be as competitive as possible in the marketplace. The modernization process under agile methodology opens up market for agile public transport management systems that are able to offer information on the routes, times, disaster, emergency, and location of the buses real time. The use of IT will assure passengers of more security. The present paper gives a brief overview of agile application proposal in the Kerala State Road Transport Corporation.

**Keywords:** Agile paradigm, Software development, Public transport management systems, IT.

**Introduction**

Public transport is the major mobile factor in a society. It connects the people in rural areas to urban areas to satisfy the needs of education, job, health, recreation and meeting the needs in all walks of life. Public transport in Kerala is mainly served by Kerala State Road Transport Corporation, an autonomous public sector organization formed in the year 1965.KSRTC with nearly 50 years since its inception, is not able to run on profitable lines. This situation can be attended to by making use of agile methodology. Agile development is mainly targeted at economically unsound, complex systems and projects like KSRTC, the major public sector service organization with dynamic, undeterministic and non-linear characteristics, where accurate estimates, stable plans and predictions are often hard to make.

**Methodology**

The various functional aspects in KSRTC include the operational sector which arranges the bus schedules, duty allocation to drivers and conductors, sequential arrangement of buses from various depots etc. The aim of KSRTC is to provide comfortable, safe, reliable, courteous, and economic and environment friendly journey to passengers. As far as the present system in KSRTC is concerned, the entire procedure is done manually which consumes time, energy and wastage of human resources. KSRTC has to make use of IT tools in the best possible measures to optimize its efficiency and reduce operational cost and at the same time provide quality services to its customers. Agile software development is a group of software development methods in which requirements and solutions evolve through collaboration between self-organizing, cross-functional teams.

**Agile principles**

The Agile methodology is based on twelve principles

**1. Customer satisfaction by rapid delivery of useful software**

The aim of service oriented sector mainly transport is customer satisfaction. KSRTC can make use of agile methodology in prompt delivery of services by helping the passengers to reach their destination at the pre fixed timings. This IT tool avoid clash of schedules and make sure that the bus services pass a particular point within a stipulated time.

**2. Welcome changing requirements, even late in development**

The requirements may change in the tedious processes including transport system and this may affect the development of the software. Agile methodology provides the suitable solution for this.

**3. Working software is delivered frequently (weeks rather than months)**

Timely supply of the software product ensures the smooth functionality and the satisfaction of customers in a short span of time.

**4. Close, daily cooperation between business people and developers**

A compact association between the customers and the organization is required in transport as it is a service oriented industry for the people. Hence the close relationship of the stakeholders is achieved and relevant in agile implementation.

**5. Projects are built around motivated individuals, who should be trusted**

Transportation projects are oriented towards the public who are the end users of the system.

**6. Face-to-face conversation is the best form of communication (co-location)**

The problem of communication leads to the ultimate failure of any entity and software is also no exception. The best method can be achieved by the implementation of the agile methodology providing better solution through the communication made possible by face to face conversation.

**7. Working software is the principal measure of progress**

The entire cycle of project implementation requires the application of software at the needed spheres of the development.

**8. Sustainable development, able to maintain a constant pace**

Working software application can be successful when the development reaches the optimum level of achievement. The agile methodology provides sustainability in the development.

**9. Continuous attention to technical excellence and good design**

Supporting the transport corporation to develop the technical and professional skills needed for attaining excellence in the related matters of scheduling , work arrangement , time keeping etc.

**10. Simplicity—the art of maximizing the amount of work not done—is essential**

In order to deliver the organisation's desired targets and results effectively and efficiently, agile methodology includes invest in the organisational capacity, capability and external relationships through simplifying the work load and at the same time applying the highest standards to decision-making and behaviour.

### 11. Self-organizing teams

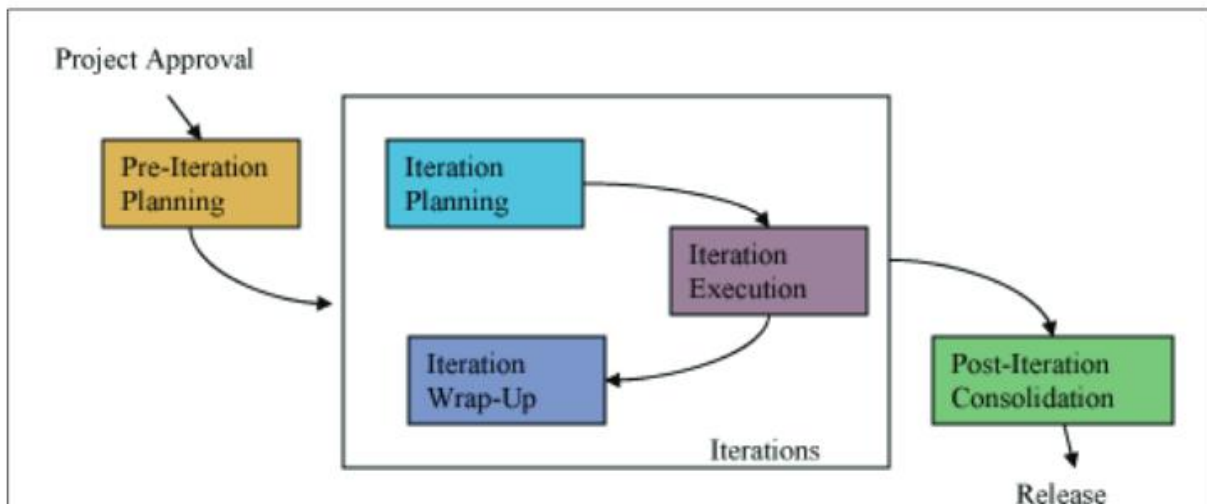
Enjoying the people who work as a team and appreciating their talents to find solutions for customers with joined-up thinking.

### 12. Regular adaptation to changing circumstances

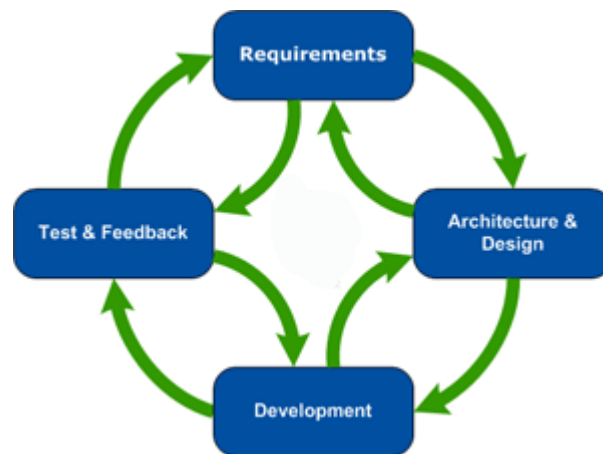
Agile method includes adaptation to circumstances which are subject to frequent changes due to the changes in implementation of programs, attitude of people, skill requirements etc.

### Agile Process

A generic agile development process features an initial planning stage, rapid repeats of the iteration stage, and some form of consolidation before release. To create a release plan, the team breaks up the development tasks into iterations. The release plan defines each iteration plan, which drives the development for that iteration. At the end of iteration, users perform acceptance tests against the user stories. If they find bugs, fixing the bugs becomes a step in the next iteration. Iterative user acceptance testing, in theory, can result in release of the software. If users decide that enough user stories have been delivered, the team can choose to terminate the project before all of the originally planned user stories have been implemented.



Agile based system will keep the stakeholders up-to-date. Moreover, in public transport sector the passengers will be benefited. Passengers can check bus schedules, route details, estimated travel time and fares, bus timings, as well as traffic information both online and on mobile devices. It will result in safer and reliable public transport system, reduced emissions due to better fuel efficiency and vehicle maintenance.



A successful agile application involves the following measures.

1. Improving our information and knowledge management ecosystem
2. Developing skills to extract value from information and to share knowledge with others
3. Embedding an ethos of creating value with others and the tools and processes to support it
4. Supporting and encouraging innovation through the transport agency business improvement approach
5. Developing enduring internal and external relationships and networks
6. Using leadership to model, expect and recognize the desired behaviours

### **Conclusion**

Agile methodology implementation in transport sector can cover interactions with individuals over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation and responding to change over following a plan. Agile development isn't a managerial free-for-all. It requires discipline and adherence to processes, even when those processes are not burdensome.

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