

Project Adaptability Assessment for adopting new Eclectic Agile Methodology

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Abstract: Adopting agile methodologies has become industrial trend over traditional one as earlier. So it is the need to have empirical studies to overcome challenges and limitations come across while inculcate agile methodologies in manifold scenarios. This paper proposes novel ways to assess your project’s capability to adopt "Eclectic" Agile Methodology, in case projects have farrago of challenges like but not limited to - Tightly coupling with downstream and upstream applications, Sprint encountering frequent unplanned severity 1 issues which need immediate attention, shared hosted environments along with schema, dependencies outside our project, cross track impacts and distributed team. Through this paper we are offering innovative tools that contains deep thought assessment parameters along with a scoring criteria to identify project fitment before the adoption of "Eclectic" Agile Methodology upfront.

Keywords: Agile, assessment, development, distributed, empirical, Severity 1, Sprint, manifesto, methodology.

1. Introduction

For Product development, there are numerous Software Development Methodologies exist [1][6]. Since early 1970's various traditional Software development process models like Waterfall process model, Prototyping model, Iterative Process model [2] and Spiral Model [3] were used. But now when time to market, respond to ever changing world of requirement has become part and parcel of customer requirement, so is the inception of Agile Development methodology get into existence since 1990's [5][10]. Unlike the traditional approach as aforementioned, Agile promotes adaptive planning, evolutionary development and incremental delivery through time boxed iterative approach which embrace challenge in adapting response to a change [9][12]. Agile fosters a culture of collaborating early and often with customer with a plan for uncertainty. So less than tiny time is spent on doing upfront future planning and prioritization to provide room for positive change and for re-prioritize things more often to compete with rivals. The prime focus of Agile is welcoming changing requirements of the customers.

Figure 1. Project Adaptability Assessment along with the Limitations and challenges of Agile Software Development Methodologies



As of now, many software development Agile methodologies exist in IT industry like Adaptive Software Development (ASD), Scrum, Kanban, eXtreme Programming (XP), Crystal methodology, Dynamic Software Development Method etc., each one of them is having its own limitations, challenges and trade-off to choose from [4]. All the various challenges and limitations of Agile Development Methodologies are specified in Figure 1.

Especially for projects which are not executed in silos however every decision taken in outside space impact their incremental delivery. So our research began with enormous analysis on them and in fact a lots of conversations between ourselves and Agile practitioners from handful of different set of companies and roles. Some of them are formally Trained Scrum Masters, Agile Coaches, Product owners etc. All were exceptionally generous with sharing their real-word experiences either good, bad, or ugly and in shedding light candidly to both the challenges and limitations of the approaches they have taken. Having said that with this I come across with deep understanding of

enormous critical challenges which are still unaddressed and require to design a methodology that will lay down approach and solution for them and simultaneously will add the value to the required developed product.

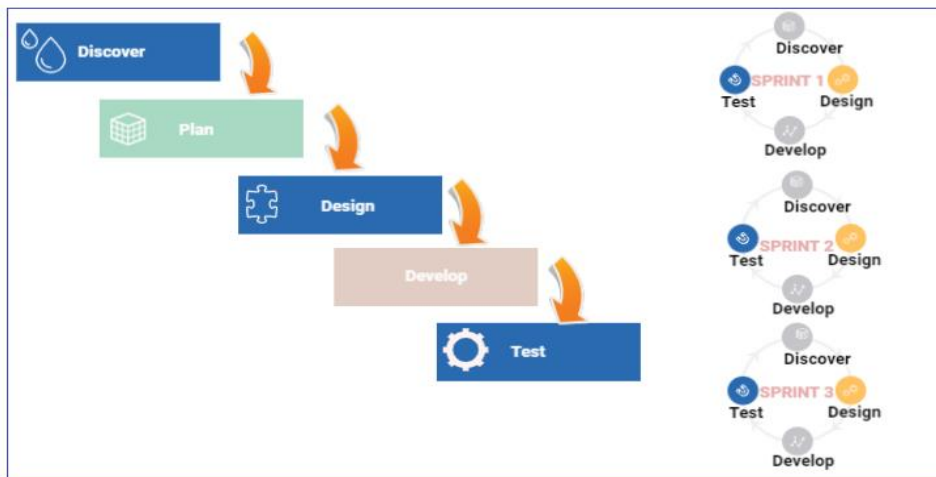
Through this paper we want to convey the novel ways to assess the fitment of our project for Eclectic Agile methodology if project have underline challenges which are still unaddressed in the existing set of Agile methodologies we have. Before a methodology is being implemented or chosen upfront for a project, the project has to go through the Value and fitment Assessment process and then the decision is made whether the methodology should be implemented into the project [11].

2. Software Development Methodologies: An overview – What is Waterfall and Agile, how they differ from each other

A software methodology is considered as a structural approach which contains a well-defined process for planning, developing, validating, deploying, monitoring and controlling the procedure of creating a specialized required product eventually [8]. Our aim is to act rightly in a synchronized manner all the time not because of someone virtue or excellence, but rather through following a common defined pattern across development cycle to make excellence as a habit. Traditionally organisations have used waterfall methodologies for their product development since many decades where customer defines requirements up front, project planning done in its entirety, so is the design of software, and then team do the development and Quality assurance of the product. Infinite products have been developed by teams this way over the years. So most of them face similar challenges specially for bringing every little change in system has to loop through the entire process from inception again which is not only cumbersome and time taking but also loose the opportunity of time to market which led to many failed projects because of inability of the traditional methodology / process which lacks in an effective way to response a change.

On the contrary “Agile Software development offers a group of framework within its kitty which compromises various approaches under which requirements and solution evolve through collaboration between self-organizing, cross functional teams [7]. It promotes adaptive planning, evolutionary development and delivery, a time-boxed iterative approach, and encourages rapid and flexible response to change” as shown in Figure 2.

Figure 2. Agile Development Methodology



In spite of a horizon of vast offerings and solution from these methodologies, still there are no straight ways to handle below challenges a complex project can have.

- Distributed Team in multiple time zones
- Shared resources / Hosting Environment
- Unplanned Severity 1 issues during Sprint
- Minimum to no Documentation for maintenance later
- Dependency on or with Upstream and Downstream applications
- Time to market
- Variable Scope

No Silver bullets, today we all know that there's no one-size-fits-all tickets to all kinds of product development. Yet it has not stop us from trying to find one for the limitation or challenges we encountered on product development.

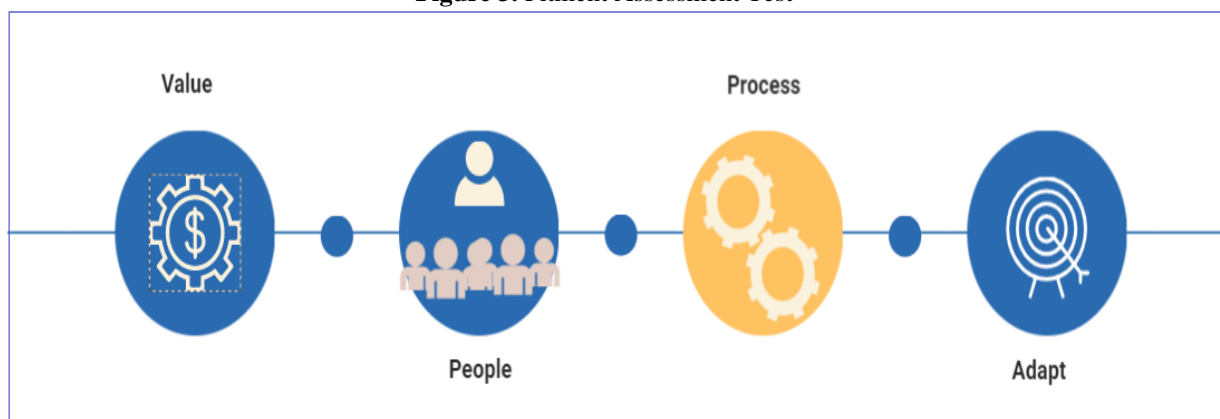
To overcome these challenges there is a need of very thoughtful analysis to be performed in choosing a methodology which need a giant step to assess the characteristics of the project with some deep though assessment parameters and tools to get the decision out of it.

3. Methodology Adaptability Criteria

A Novel criteria is proposed in this paper on the fundamental concept to adopt Eclectic agile methodology basis only if it is adding value to the project. The methodology is adopted on the prime base to deliver the efficient product that best fits the requirements of the customer. The point of this passage is that - software development team must be aware of characteristics, contextual factors and challenges of their project. All critical resources, if not the whole team, must be engage and all the assessment parameters must be think through strategically, technically and tactically about the current project in hand.

The functioning of this criteria is in two-fold and it defines as Value analysis and fitment assessment test. The first Phase is defined as Value Analysis that determines the benefits that can be expected if the project implements the Eclectic Methodology. Once the benefits are justified, this phase is followed by a Process and People Assessment phase which is used to assess the Process and People characteristics against the requirements of the methodology. The Fitment Assessment test is based on the same fundamental concept to determine if the Methodology is justified for the project. This is shown in figure 3 that depicts the steps for determining if a project should adopt the Methodology.

Figure 3. Fitment Assessment Test



Based on the assessment of different characteristics, projects can directly deploy the methodology or the people and project characteristics needs change up to possible extent to meet the requirements and fitment. Thus, the focus is to select the right kind of methodology based on the needs and characteristics of each project.

4. Value and Fitment Assessment Process

The Value and Fitment Assessment Process is an assessment process that shows the steps for determining if a project should adopt Eclectic Methodology. The functioning of this process is divided into two phases - Value Analysis phase and Process and People Assessment phase.

4.1 Value Analysis

The Value Analysis phase is the first phase of Value and Fitment Assessment Process which defines the assessment parameters which are used to assess and demonstrate the benefits, a project can gain by adopting Eclectic Methodology. After the benefits justification, the Methodology assesses whether the people and project capabilities support the requirements of the same. There are seven Value Assessment Parameters defined below:

Value Assessment Parameters: The Value Analysis phase defines the assessment parameters which are used to assess and demonstrate the benefits, a project can gain by adopting this Methodology. After the benefits justification, the Methodology assesses whether the people and project capabilities support the requirements of the same. There are seven Value Assessment Parameters defined below:

1. Distributed Team: Mostly the teams working in a project are not co-located but they are distributed around the globe. The aim is to establish proper communication among the team members in spite of working in different time zones at geographical distributed environment.
2. Shared resources and Hosting environment: When Database schema and hosting environment are shared with other platform applications, changes to them require lots of rigorous coordination with other applications to have their buy in and in ensuring that our changes leaving no impact on them.

3. **Unplanned Severity 1 issues:** Projects may receive multiple unplanned severity1 issues during Sprint. Managing these unplanned issues may lead to compromising with the sprint goal. Severity 1 issues during sprint execution put its commitment on a toss, as neither these issues can wait nor you can leave your sprint to fail.
4. **Documentation:** Often Story cards have been used to write requirements in Agile, which gets discarded soon after sprint planning, in the longer run when we have to maintain the projects, insufficient details of features and epics result in nightmare.
5. **Dependency on Upstream / Downstream applications:** The Project has interaction with multiple Upstream and Downstream systems. Having so much dependency over multiple systems, this methodology is beneficial even for the large-scaled projects and technically complex projects.
6. **Time to market:** To harvest early benefit and have edge over competitors, Agile focus on the launching product at earliest possible. This gives an opportunity to earn incentive through establishing product before others and win time through response and feedback.
7. **Variable Scope:** When change in scope left as only constant in the project, then intense prioritization and re-prioritization is required to slide in and slide out stories of equal size, so that high priority requirement deliver to market at earliest possible.

These seven Value Assessment Parameters have been listed in Column 1 of Table 1. Each of these parameters are having a score and a specific explanation of each one is given in Statement 1, Statement 2 and Statement 3. Then the demand of the project is assessed and is assigned a score having values 1, 2 or 3.

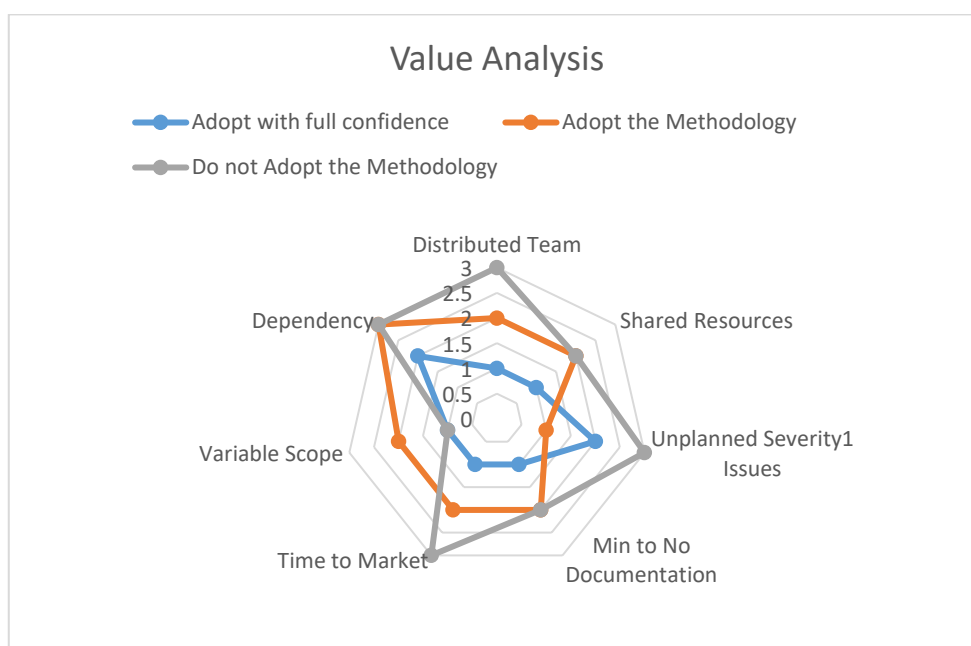
Table 1. Value Analysis Engine - A screen shot of the tool

Col – “A”	Col - “B”	Col - “C”	Col - “D”	Col – “E”
Project Fitment analysis				
Value Appraisal parameters	Condition - 1 Choose 1, if it fits in your project.	Condition - 2 Choose 2, if it fits in your project.	Condition - 3 Choose 3, if it fits in your project.	Score
Distributed Team in multiple time zones	Majority of the team members in your project are distributed across multiple geography.	Some of the team members in your project is distributed across multiple geography.	Project team is completely co-located.	Choose the relevant score (Either 1, 2 or 3) basis mentioned assessment Parameters.
Shared resources /Hosting Environment	Majority of resources and Hosting Environment used in your project are shared	Some of the resources / Hosting Environment used in your project are shared	None of the resource / Hosting Environment used in your project is shared	Choose the relevant score (Either 1, 2 or 3) basis mentioned assessment Parameters.
Unplanned Severity 1 issues	Project received multiple severity 1 issues during sprint execution.	Project received sometimes severity 1 issues during sprint execution.	Project never received severity 1 issues during sprint execution.	Choose the relevant score (Either 1, 2 or 3) basis mentioned assessment Parameters.
Minimum to no Documentation	No documentation available or done in the Project	The documentation being generated is very minimal.	The project needs everything listed in the documents.	Choose the relevant score (Either 1, 2 or 3) basis mentioned assessment Parameters.
Dependency on Up / Downstream applications	Multiple Upstream and downstream applications, Project is dependent upon.	Very less Dependency on Up / Downstream applications	No Interaction with Upstream and downstream applications	Choose the relevant score (Either 1, 2 or 3) basis mentioned assessment Parameters.

Fast/short Launch market	Most of the features in your project have a quick launch to Market requirement.	Some of the features in your project have a quick launch to Market requirement	The project does not have a quick launch to Market requirement.	Choose the relevant score (Either 1, 2 or 3) basis mentioned assessment Parameters.
Scope Creep	There are high level of requirement volatility and scope creep issue in your project.	There are some level of requirement volatility and scope creep issue in your project.	Your project has clear requirements listed upfront.	Choose the relevant score (Either 1, 2 or 3) basis mentioned assessment Parameters.

After the scores are entered for every Value Analysis Parameter, the Value Analysis Engine assigns a priority to each parameter and based on the values entered, automatically calculates and provides the Value Analysis Output. The Value Analysis Output recommends whether or not you can adopt the Eclectic Methodology for your project. The Value Analysis Engine makes the recommendation after analysing all of the Value Analysis Parameter Scores and assessing if the Eclectic Methodology will add value to the project. A detailed explanation is shown below in Figure 4.

Figure 4. Value Analysis



The output of the Value Analysis Engine has been described below and shown in Figure 5:

Value Analysis Output 1: Adopt the Methodology with confidence

Explanation: The project satisfies all the requirements of the methodology and maximum benefits will be harvested in terms of functionality, cost efficiency, functional efficiency etc. by adopting this Methodology in the project.

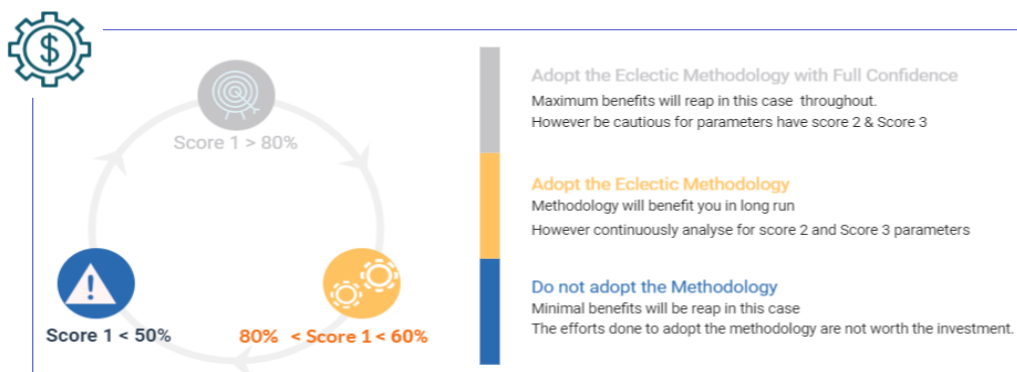
Value Analysis Output 2: Adopt the Methodology

Explanation: You will get limited benefits by adopting this Methodology in the project since very few value analysis parameters have been assigned a score of 2 or 3.

Value Analysis Output 3: Do not adopt Methodology

Explanation: You will get minimal or no benefits by adopting this Methodology in the project.

Figure 5. Value Analysis Engine Output



4.2 Process and People Assessment

Once the output of the first phase of Assessment Process i.e. Value Analysis is defined, it is the time to enter in the second phase of Fitment Process i.e. the Process and People Assessment for Projects. There are three different parameters to assess the Process and People Assessment listed below:

Process and People Assessment Parameters:

1. Principle of Architecture
2. Principle of Business/Stakeholder Availability
3. Principle of Stakeholder Commitment

All these parameters are listed in the Column A of Table 2 as shown below. The Table 2 is representing the Process and People Assessment Engine. These parameters have been assigned a score of 1, 2 or 3.

Table 2. Process and People Assessment Engine - A screen shot of the tool

Col – “A”	Col – “B”	Col – “C”	Col – “D”	Col- “E”
People and Process Appraisal of Projects.				
People and Process Appraisal Parameters.	Condition - 1 Choose 1, if it fits for in your project.	Condition - 2 Choose 2, if it fits for in your project.	Condition - 3 Choose 3, if it fits for in your project.	Score
Architecture	Project team completely accept to meet the Upfront understanding of impact on upstream and downstream applications due to our or their changes	Project team may or may not be able to accept to meet the Upfront understanding of impact on upstream and downstream applications due to our or their changes	Project team does not accept to meet the Upfront understanding of impact on upstream and downstream applications due to our or their changes	Choose the relevant score (Either 1, 2 or 3) basis mentioned assessment Parameters
Business / Stakeholder Availability	Product owner or Program Managers are available throughout for the development teams	Product owner or Program Managers may be or may be not available throughout for the development team’s support	Neither Product owner nor Program Managers are available throughout for the development team’s support.	Choose the relevant score (Either 1, 2 or 3) basis mentioned assessment Parameters
Commitment	Stakeholder accept methodology, committed to and will continue support team even if lower results achieved or demonstrated in one or some of the areas.	-	Stakeholder are not accepting in case lower results achieved or demonstrated in any area.	Choose the relevant score (Either 1, 2 or 3) basis mentioned assessment Parameters

After all scores are entered for every Process and People Assessment Parameters, the Process and People Assessment tool assigns a priority to each parameter and automatically calculates and provides an appropriate

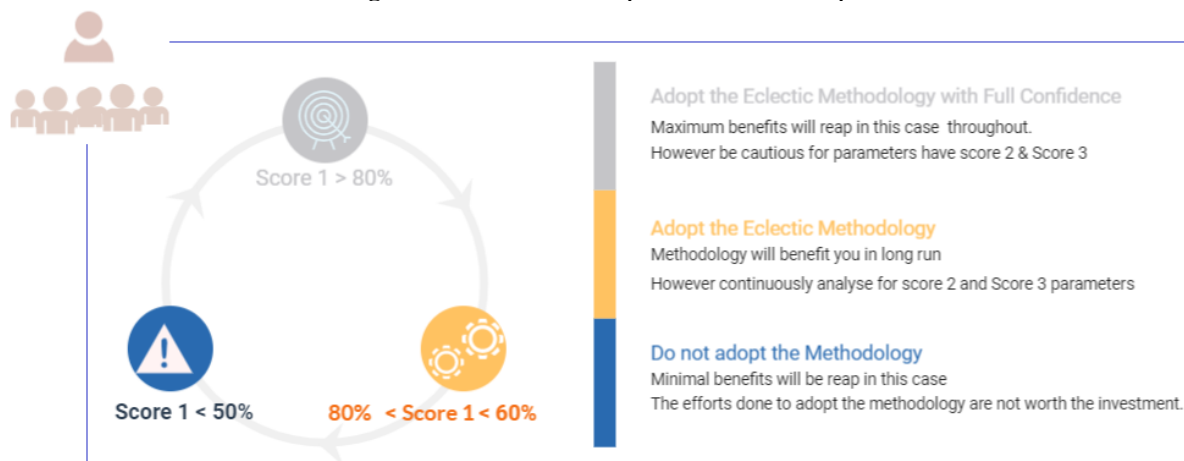
suggestion as the Process and People Assessment Output. The Process and People Assessment Output defines whether our process and people characteristics are compliant with the Eclectic Methodology requirements. Corresponding to each suggestion, there is a detailed explanation provided in Figure 6.

Figure 6. Process and People Assessment



The output of the Process and People Assessment Engine has been described below and shown in Figure 7:

Figure 7. Process and People Assessment Output



Process and People Assessment Output - 1:

Project is compliant with Methodology with confidence: It shows that our process and people characteristics are compliant with the Methodology requirements and the project will get superior benefits by adopting the Methodology in the project.

Process and People Assessment Output - 2:

Project is compliant with Methodology: This means that the process and people characteristics are compliant with the Methodology requirements, but the second parameter - Business / Stakeholder Availability depict that product owner availability may not be during the development phase or phase of doubts. So the Methodology suggests to being cautious on this parameter throughout the development cycle of the project, as this could be risky item.

Process and People Assessment Output - 3:

Project is not compliant with Methodology: This shows that the process and people characteristics are not compliant with the Methodology requirements and so the Project should not adopt the Methodology.

A Snapshot of all the three suggestions of the Project and People Assessment Output is depicted in Figure 7. Based on the Scores selected for each Parameter, one among the three assessment results will be displayed by the tool.

5. Conclusion

Besides the existence of multiple agile methodologies there are still unaddressed complexities, challenges and circumscriptions subsist. We have provided various insights into them and in challenges involved with projects in adopting agile Methodologies. Since harvest value early is the driving factor today. So through this paper we have highlighted the influence of these factors / parameters in choosing the Eclectic agile methodology. As we found evidences about the influence of these factors in adopting agile software development methodology either in productivity, cost, overall success or time to market sphere. Some sharply may obstruct the adoption of these methods as can optically discerned with reverence to autonomy of self-organizing teams and result in decision making and customer engagement during the agile software development. The outcome of our research is to apportion ways to determine the project fitment before adopting the Eclectic methodology, sundry tools and methods have been shared to check feasibility first before adopting the methodology upfront.

The assessment criteria to avail the developers and practitioners culling a felicitous development methodology for a certain quandary or project. Culling the right methodology for the desired product is very crucial for the efficacious and timely product delivery. From number of methodologies available for the software development but culling the eclectic is the focus of this paper. This paper proposed a fitness / assessment criteria that defines a step-by-step process to identify the most felicitous development methodology.

This research is in continuation of our earlier papers on Agile Methodology challenges and Estimations in Agile. Future research interest will include the overall methodology design and multiple folds / steps involved in adopting Eclectic agile methodology.

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