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Tables of Abbreviations

Abbreviated Form	Full Form
DSDM	Dynamic Systems Development Method
SSADM	Structured Systems Analysis and Design Method
USDP	Unified Software Development Process
XP	Extreme Programming
RAD	Rapid Application Development
RACI	Responsible, Accountable, Consulted, and Informed
PRL	Prioritised Requirement List
MD	Managing Director
CEO	Chief Executive Officer
USA	United States of America
MoSCoW	Must Have, Should Have, Could Have, Won't Have this time
TOR	Term of Reference
SRS	System Requirement Specification
PRINCE2	PRojects IN Controlled Environments
IT	Information Technology
PID	Project Initiation Document
SDT	Software Development Team

Memorandum

To: Altruistic Inc, USA
From: HT Company Pvt. Ltd.
Date: 20th December 2019
RE: Regarding the Project Management Team
Greetings Sir/Madam,

This memorandum has been developed in order to define different procedures that are to be followed while carrying out the project. The propose is to introduce a project management team in order to develop a File Storage & Management System application which is named as Altru Drive. The main goal of the project will be to develop and deploy a file storing and sharing application. This new application allows its end user to store files and manage the files in a systematic order. Also, the application allows viewing, sharing and searching of content in an efficient and user-friendly way. Moreover, backup server is maintained for backup and recovery of data and information. The main target will be to establish cloud storage facility for Altruistic Inc.

Agile methodology can be recommended in order to build this system. This methodology is chosen due to high interaction between client and project team members. Agile methodology makes project team members easier to picturize the requirements of client which can lead to optimum client satisfaction. Hence, this leads to better team coordination and enhancement in decision making on various features that are required for the project. A suitable dynamic team with proper co-ordination among team members is required for developing this system. Hence, DSDM methodology can be implemented while working on this project. PRINCE2 standard technique will be used in order to manage the project. Therefore, with proper implementation of DSDM methodology with PRINCE2 as project management standard, there can be smooth and periodical development in the project. For the sound communication and coordination between two parties it is better to define the point of contact. It's the responsibility of project manager to ensure that every stakeholders of project are in loop regarding the process of project. Hence, I will ensure that all the task which has been defined are being carried out as per the requirement and there is proper coordination and communication among the stakeholders. Furthermore, for optimum value delivery of project, agile suggests face to face communication. Therefore, daily stand ups, facilitated workshops, meeting and video conferencing will be highly prioritized for the project.

The project will commence from 1st January 2020 and is expected to be complete by 1st September 2020. In first month of the project, budget of project is to be allocated, feasibility study is carried out, requirement analysis is done and timebox planning is conducted. Then, timebox are planned as per the requirement of system. Hence, total six timebox are to be planned with each timebox of 1 month. Therefore, development task is to be carried out for six months and with completion of each timebox allocated in timebox, a deliverable system is be provided for ensuring that all the task that are being carried out is as per the requirement. Communication will be carried out as defined in RACI matrix which is provided in this document. The roles of each members have also been defined in RACI matrix. The requirement of the projects will be prioritized based on MoSCoW prioritization and the delivery of project will be carried out in every four week which will be defined in a time box. Each time box of the project can be considered as a milestone of the project. So, in case of any further queries you can reach out to me. The pricing defined for the project is around $27,000 USD. All the resources that are required for the project have been included in the given price.

With Regards,
Hrishav Tandukar
Project Manager
HT Company Pvt. Ltd.

Software Development Approach

Software Development approach is the process either developing new software solutions or modifying existing software solutions. Software can be designed in various ways. There are various approaches for developing a software. Here, comparison has been done in between traditional software development approach and agile software development approach. (Purplezeus, 2020)

Traditional Approach

The traditional method uses a linear approach, where a sequential order will complete the phases of the software development process (Morelos, 2018). This means that a stage must be completed before the next one begins (Morelos, 2018). Traditional software development approach is based on pre-organized phases/stages of the software development lifecycle (KPI Partners News Team , 2018). Here the flow of development is unidirectional, from requirements to design and then to development, then finally to testing and maintenance (KPI Partners News Team , 2018). In classical approaches like the Waterfall model, each phase has specific deliverables and detailed documentation that have undergone thorough review process (KPI Partners News Team , 2018). Traditional approaches are well suited for the projects in which requirements are well understood (KPI Partners News Team , 2018).
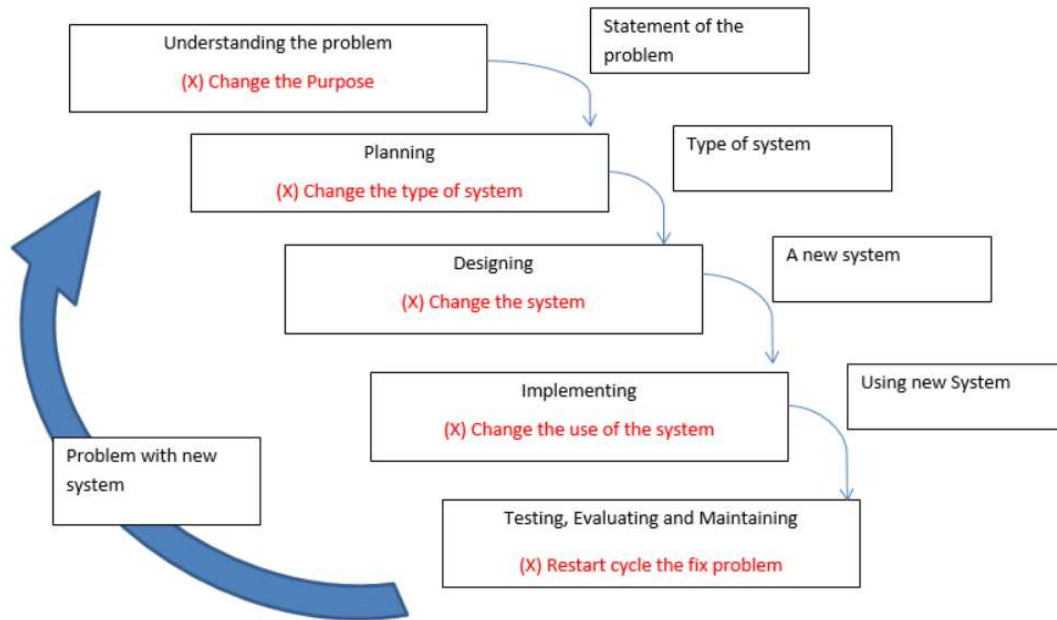
Figure 1: Traditional approach of Software Development. (Weebly, 2020)

The above diagram illustrates traditional approach of software development.

Stages of traditional approach of software development

- Requirements gathering and documentation
- System design
- Code and unit testing
- System testing
- User acceptance testing
- Bug fixes
- Product delivery

Agile Approach

Agile Software Development is an approach that is used to design a disciplined software management process which also allows some frequent alteration in the development project (Tatvasoft, 2020). This is a type of software development methodologies which is one conceptual framework for undertaking various software engineering projects (Tatvasoft, 2020). It minimizes the risk as it develops a software in short time boxes which are called iterations (Tatvasoft, 2020). Moreover, Agile Approaches are customer friendly which means that customers are allowed to make changes even during the time of development (KPI Partners News Team , 2018). Therefore, there can be optimum customer satisfaction while using agile approach for software development (KPI Partners News Team , 2018).

Manifesto for Agile Software Development

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan (Agilemanifesto, 2001)
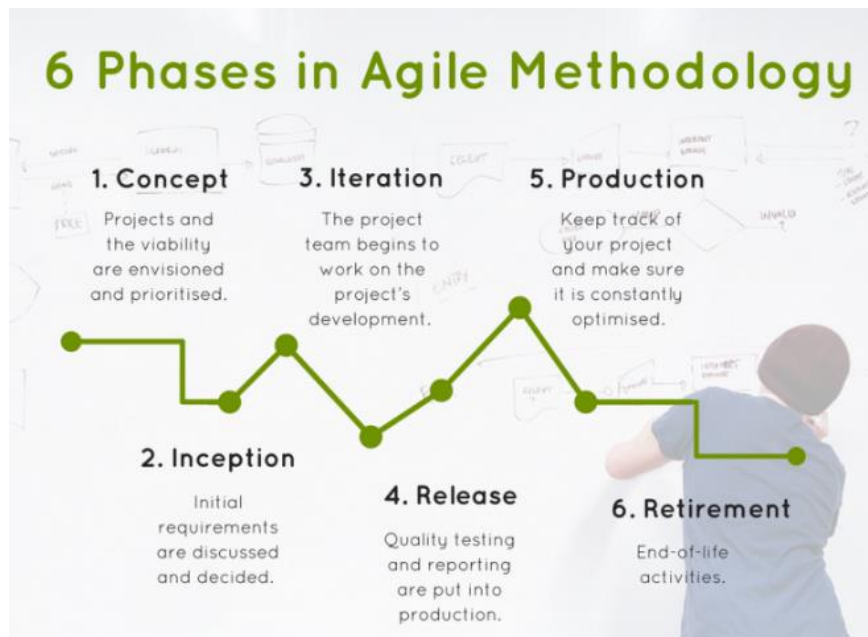
Figure 2: Six phases of agile methodology.

The above figure illustrates the six main phases of agile methodology.

Advantages of Agile over Traditional approach

- Although the need and solution for the problem statement / business is defined in advance, they can be modified at any time.

- Requirements / User Stories may be made available regularly suggesting better opportunities for mutual understanding between developer and user.

- Through segregating the project into different modules, the solution can be calculated and distributed periodically.

- The customer has the opportunity to evaluate solution modules in order to determine whether the business needs are being met, thus ensuring quality results.

- Reusable components may be created.

- Documentation is less prioritised, resulting in less time consumption and spending. (KPI Partners News Team , 2018)

Comparison in between traditional and agile approach

Basis	Traditional Approaches	Agile Methods
Organizational structure	Linear	Iterative
Software Development	Process oriented	People oriented
Project Management Style	Command and Control	Leadership and collaboration
Communication	Formal	Informal
Role of Client	Important	Critical
Process Model	- Waterfall - Spiral - Prototype	Evolutionary approach
Project Lifecycle	Based on tasks or activities	Based on software product features
Management style	Autocratic	Decentralized
Change	Sustainable	Adaptative
Documentation	Heavy	Minimal
Measurement of success or completion	Conformation from client	Delivery of business value
Requirements	Stable and is known in beginning of project	Emergent with the rapid changes in the project
Architecture	Designed for stable and predictable requirements	Designed as per the current requirements
Stages	Requirements gathering and documentation	- Project initiation - Sprint

	• System design • Code and unit testing • System testing • User acceptance testing • Bug fixes • Product delivery	• Demos

Table 1: Comparison in between Traditional approach and Agile approach.
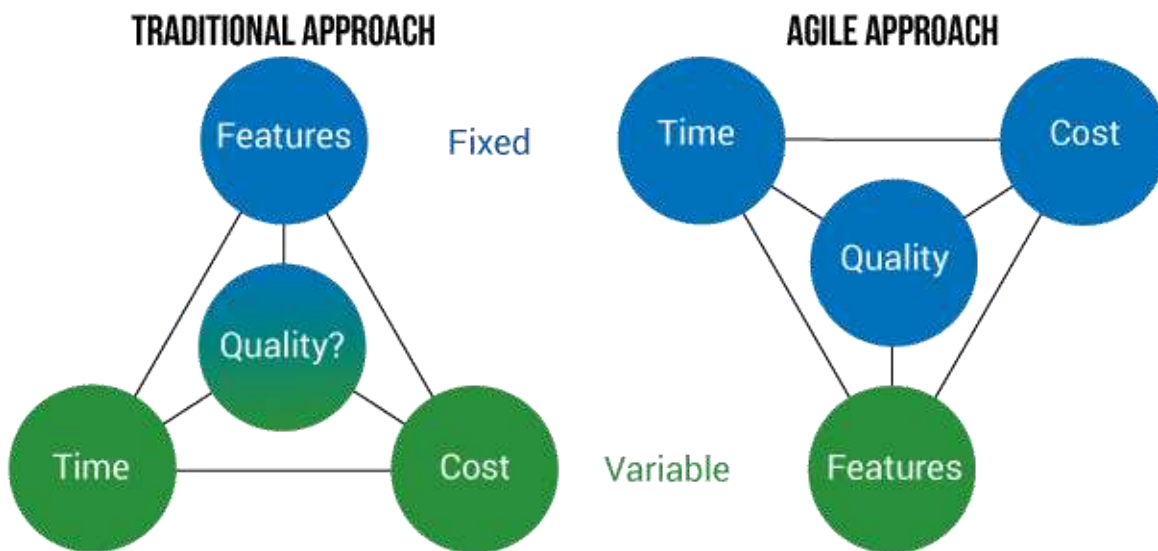
Figure 3: Comparison between traditional and agile approach.

The above figure represents the comparison in between traditional and agile approach with respect to features, time, quality and cost. The above figure illustrates that in traditional approach features are fixed whereas in agile approach times and cost are fixed. Likewise, in traditional approach time and cost are variable whereas in agile approach features are variable.

Software Development Methodologies

Software development methodology is a process or series of processes used in software development. Software development methodology is generally designed to describe the life cycle of a piece of a software. It also refers to the codified communication. It usually sets a norm between a group of people about the task which is to be carried out and method for passing information between each individuals of the project. The information can be documentation, discussion, drawing, etc. (Alliance Software, 2020)

Selection of Software Development Methodology

Quality of a product should never be neglected while developing an application. Moreover, customer satisfaction is very essential in development of project. There are various software development methodologies formed till today in order to manage software development projects. All methodologies have their own pros and cons. Therefore, traditional development methodologies should be compared with agile methodologies in order to select a suitable methodology.

Selecting a software methodology is not an easy task. Hence, there are some of the factors that are to be kept under consideration while selecting a development approach:

- Requirements
- Solution or the end product
- Feedback on the work done
- Frequency of change request or enhancements
- Cost of Delay
- Experience on projects

Today, there are traditional methodologies such as Structured Systems Analysis and Design Method (SSADM), Unified Software Development Process (USDP) and agile methodologies like Dynamic Systems Development Method (DSDM), SCRUM and Extreme Programming (XP). The selected methodology might not be selected for all projects.

After considering requirement, cost, and deadline, two appropriate software development methodologies for Altruistic Inc are:

Structured System Analysis and Design Method (SSADM)

Structured System Analysis and Design Method starts from the feasibility of the project to deployment of the project. There are various series of techniques and conventions for recording and communicating information pertaining to these in both textual and diagrammatical form. (techopedia, n.d.)

Some of the important characteristics of SSADM are:

- Dividing a project into small modules with well-defined objectives
- Useful during requirements specification and system design stage
- Diagrammatic representation and other useful modelling techniques
- Simple and easily understood by clients and developers
- Performing activities in a sequence (techopedia, n.d.)
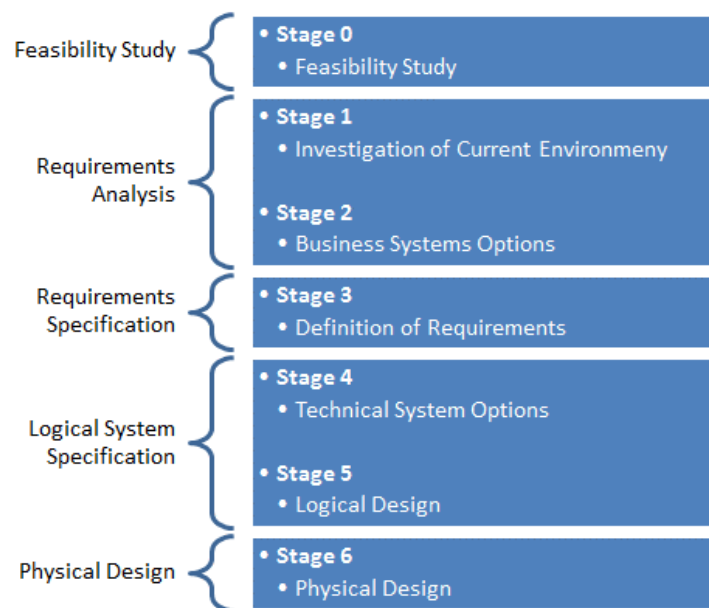
Figure 4: Structured System Analysis and Design Method (SSADM). (Varela, 2016)

The above figure illustrates all the stages of Structured System Analysis and Design Method.

Stages of SSADM

Feasibility Study

Feasibility study is the first stage of SSADM. In this stage, technical analysis and feasibility project of is studies. Also, cost-effectiveness of project is determined through business requirement analysis.

Requirement Analysis

Requirement analysis refers to understanding of various functional and non-functional requirements of the client. Then, a logical flow of the existing system is developed, and the current problem is identified. After identifying problems, possible solutions and risks are identified for the project. Finally, requirements are outlined, and solutions are chosen in this stage.

Requirement Specification

In this stage, system design is specified, and the chosen solution is polished in this stage.

Logical System Specification

There can be various hardware and software that can be required while developing a system. Therefore, in this stage hardware, software, platforms for the system are determined.

Physical Design

In this stage, physical database design is developed. Also, functions are mapping to system configuration in this stage.

Dynamic System Development Model (DSDM)

DSDM is an agile method which is largely based on Rapid Application Development (RAD) (solutionsiq, n.d.). DSDM is vendor-independent, covers the entire lifecycle of a project and provides best practice guidance for on-time, in-budget delivery of projects, with proven scalability to address projects of all sizes and for any business sector (Business, 2019).

Some of the advantages of DSDM are:

- Basic product functionality can be delivered rapidly to the end user
- Developers have easy access to end-users which makes work more efficient
- Projects are reliably completed before the allocated deadlines (Productplan, 2019)
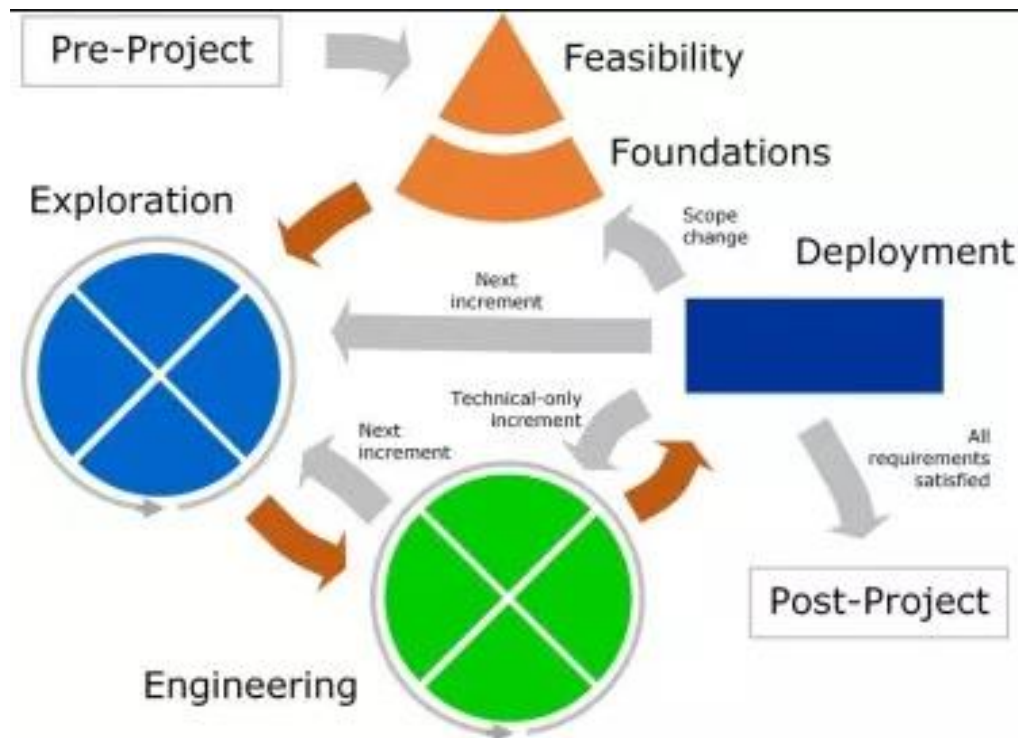
Figure 5: Dynamic System Development Model (DSDM)

The above stage represents the phases that are present in Dynamic System Development model.

Nine principles of DSDM

The nine principles of DSDM are as follows:

1. Active user involvement is imperative.

2. DSDM teams must be empowered to make decisions.

3. The focus is on frequent delivery of products.

4. Fitness for business purpose is the essential criterion for acceptance of deliverables.

5. Iterative and incremental development is necessary to converge on an accurate business solution.

6. All changes during development are reversible.

7. Requirements are baselined at a high level.

8. Testing is integrated throughout the life cycle.

9. A collaborative and cooperative approach between all stakeholders is essential. (Islam, 2020)

Seven phases of DSDM

Pre-project

Pre-project is the very first phase of DSDM in which it is made sure that everyone who is involved in project is aware about the objectives of project. The project is conceptualized and initiated after agreeing to the Terms of reference.

Feasibility study

In this phase, financial and technical analysis is carried out. Also, it is verified if the project is suitable for Rapid Application Development (RAD). Hence, in case if the project is found to be non-feasible for RAD, project development is not carried out using DSDM.

Foundations

In this stage, business aspects of the projects are identified. The following questions are discussed and answered in this phase:

- Who will be the participants
- Will the project make sense from a business point of view
- Will it be profitable
- What will be the best work plan
- What resources are required through the development cycle
- What tools and technologies will be required for building and deployment

Exploration

In this phase, functional phases are explored. the prototype is built iteratively and improved through demonstration to the user by taking feedback and incorporating changes.

Engineering

In this phase, the prototype is ensured to meet client's satisfaction and now the software is expected to be ready for the deployment.

Deployment

The deployment phase generally comprises of three activities: Assemble, Review and Deploy.

Assemble

At first all the resources that are required for deployment are assembled in this phase. There might not be huge task in terms of smaller projects, but it can be time consuming in case of large projects.

Review

After assembling every element, the software is thoroughly reviewed in order to ensure that the software that is to be released meets the requirements and the standards of the iteration.

Deploy

Once the software is reviewed and finalized. It is then approved and then the actual deployment of software is done, and the release is bought into operation.

Post project

After the final deployment of the product, the developed product is monitored in order to analyse the effectiveness of the product and in case of any problem in the product, the problem is reviewed, and necessary solutions are provided for the identified problem. Finally, optimum value delivery can be obtained for the business.

Roles and responsibilities in DSDM

Project Level

The roles at the Project Level relate to directing and/or managing aspects of the project within their specialty or area. Roles in the Project Level would be in charge of interacting with stakeholders and providing project governance. They provide the project's vision and work required to ensure the vision is being followed. (Render, 2020)

Solution Development Team

The Solution Development Team (SDT) is responsible for putting the vision to life. They work collaboratively to develop the project's expected product. People appointed to these positions should not be phased out or replaced as much as they can be regulated. The goal is to create a secure SDT which will take ownership of its work and area of responsibility. (Render, 2020)

Supporting Roles

Supporting Roles will provide feedback on the project as needed. They can support multiple initiatives or have other organizational functions. A work in a project is oriented towards advising or assisting the Solution Development Team in an area of expertise. (Render, 2020)

Figure 6: Roles and responsibilities in DSDM. (Render, 2020)

The above diagram illustrates the DSDM roles which are color-coded by primary purpose or type.

Orange represents those roles involved in maintaining or envisioning the interests of the business. (Render, 2020)

Green roles are those involved in the technology or contributing to the technical solution of the project. (Render, 2020)

Blue roles are for the leadership of the project and those are just the Project Manager and the Team Leader. (Render, 2020)

Gray roles are those roles that pertain to ensuring that DSDM practices are known and maintained. (Render, 2020)

Mix of two colour includes two separate area of interest. For example: Business Analyst has both business and a solution/technical focus. (Render, 2020)

Project Level

Business Sponsor

The Business Sponsor Is the senior project-level business role. The Business Sponsor is promoter of a project and responsible for the business case of the project and the budget of the project. The position requires a higher level of authority within the company since business and financial decisions must be made. If a project is within a DSDM program, this role may be filled by the Program Manager. (Render, 2020)

Responsibilities of Business Sponsor:

- Maintaining the project's Business Case
- Oversight of the project's finances
- Providing effective decision-making processes
- Resolving escalated conflicts
- Empowering the other business roles to fulfil their best work
- Remaining informed and engaged in the status of the project and ongoing work (Render, 2020)

Business Visionary

The Business Visionary works to interpret the business needs as well as provide the project team with the business vision. They are needed throughout the duration of the project to provide a single, clear vision for the project. If the project occurs in a program, the role of Business Visionary may be filled by the role of Business Change Owner within the management of the DSDM programme. (Render, 2020)

Responsibilities of Business Visionary:

- Provide the business vision and explain that to the team and other stakeholders
- Resolve conflicts related to the business vision
- Ensure project progress matches the business vision
- Help interpret project change requests
- Contribute to design and review sessions where the business vision is concerned
- Provide business resources for the project

- Provide servant-leadership to the business roles within a project (Render, 2020)

Technical Coordinator

The Technical Coordinator is the technical authority of the project which ensures the coordination and organization of the technical activities. They would provide the project with the technological vision and work towards ensuring it aligns with the business vision. In a DSDM program, the Technical Coordinator may be filled by the Program Technical Architect. (Render, 2020)

Responsibilities of Technical Coordinator:

- Overseeing the technical architecture of the project
- Coordinating the technical activities
- Consulting on the feasibility of technical solutions
- Evaluating possible technical options to meet the business objectives
- Ensuring that technical best practices are followed
- Managing transitions of the developed solution into a released state
- Empowering the technical project roles through servant-leadership
- Resolve conflicts related to technical decisions (Render, 2020)

Project Manager

The project manager has the responsibility of providing the team with a "Agile-style leadership." It makes the DSDM Project Manager more of a servant or facilitative leader than of having an authoritarian leadership style. The Project Manager manages and empowers the entire team and works together to incorporate the pieces. (Render, 2020)

Responsibilities of Project Manager:

- Ensure timely and effective communication
- High-level planning
- Collaborating with stakeholders on the delivery plan
- Monitor project progress
- Manage and resolve risks
- Motivate and empower the team

- Handle escalated problems (Render, 2020)

Solution Development Team

Business Analyst

The Business Analyst is part of the Solution Development Team but supports Project Level roles. They're an intermediary between the SDT and the Project Level. They support the development of the solution by guiding the SDT to make appropriate decisions within the solution development. (Render, 2020)

Responsibilities of Business Analyst:

- Assist the Business Visionary in the advancement of the business vision
- Identify possible risks and impacts on the implementation of the solution
- Assist Project Level in business case creation
- facilitate communication as needed
- Ensure requirements are properly defined and achievable (Render, 2020)

Business Ambassador

The Business Ambassador serves the business needs within the Solution Development Team. Throughout Evolutionary Development they provide the group with daily requirements, being the key decision-maker for the company. (Render, 2020)

Responsibilities of Business Ambassador:

- Contribute to requirements, design, and review sessions
- Provide the business perspective for solution team development decisions
- Responsible for the documentation of the solution and support documentation
- Ensuring that users are trained on the solution (Render, 2020)

Solution Developer

The Solution Developer translates the business requirements into a Solution Increment that meets the needs of the increment. It involves the different roles that are needed to complete the solution or increment of the solution. This should be a full-time role solely devoted to the project helping to reduce risk and waste. (Render, 2020)

Responsibilities of Solution Developer:

- Working together to develop an increment of the solution each iteration
- Adhering to technical constraints, and the organization's standards of development
- Participate in quality assurance (Render, 2020)

Solution Tester

The Solution Tester is tasked with making sure the solution works, testing to the agreed-upon standards. (Render, 2020)

Responsibilities of Solution Tester:

- Define the testing needs and scenarios for test cases
- Test the solution increment and the whole solution
- Track and report testing activities and quality issues (Render, 2020)

Team Leader

The Team Leader is a servant-leader for the Solution Development Team. The work to make the team function as a cohesive and collaborative whole unit. This role will ideally be an elected role, chosen by members of the SDT, as such they may also be performing one of the other roles on the SDT. (Render, 2020)

Responsibilities of Team Leader:

- Facilitate the team focus on solution delivery
- Encourage and motivate team members within their defined roles
- Help to keep the development process focused and controlled
- Manage the planning details and risk management activities for the timebox level
- Facilitate communication, stand-ups, reviews, and retrospectives (Render, 2020)

Supporting

Technical Advisor

The Technical Advisor provides technical support for the solution. They may be responsible for operational changes, assisting with the release, or ongoing maintenance of the solution. (Render, 2020)

Responsibilities of Technical Advisor:

- Review the technical requirements and provide specialized input
- Provide operational acceptance testing
- Provide training on technical operations and support staff (Render, 2020)

Business Advisor

The task of the business advisor is to help ensure that the solution testing meets the needs of the business. They might be an authority on the subject matter and/or a potential user of the solution, or they could offer regulatory and legal advice. They advise on the solution from a more direct and detailed business perspective. (Render, 2020)

Responsibilities of Business Advisor:

- Provide specialist input into the solution (Render, 2020)

Workshop Facilitator

The Workshop Facilitator will manage the workshop process. They are responsible for organizing meetings that achieve a workshop objective. (Render, 2020)

Responsibilities of Workshop Facilitator:

- Agreeing to the scope of the workshop with the workshop owner and facilitating the workshop (Render, 2020)

DSDM Coach

The DSDM Coach is responsible for helping the team understand the DSDM approach. They are there to ensure that DSDM is followed and to help those outside the team understand the process. They provide the details of DSDM. (Render, 2020)

Responsibilities of DSDM Coach:

- Providing detailed knowledge of proper DSDM practices (Render, 2020)

Reason for selecting DSDM

Justification 1

Case Study Scenario	Product plays vital role in terms of growth of company. Therefore, tentative timeframe for the start and end of the project is to be defined. After analysing the timeframe for the project, budget of the project can also be estimated.
Attribute	Estimating the timeframe and budget.
Justification	In DSDM, time planning is prioritized. Feasibility and foundation phase provide guidance for development of delivery plan of the project. Moreover, starting time and ending time of the project can also be allocated which helps in budget allocation of the project.

Table 2: First Justification for selecting DSDM.

Justification 2

Case Study Scenario	There are various functional and non-functional requirements defined for the project, but all the features should not be shipped at once.
Attribute	Incremental timeboxed development as per the prioritization of feature
Justification	In DSDM, timeboxes are developed according to the prioritization of the functional and non-functional requirement. For instance, if we start developing product with 'must have' features then time-to-market is generally less. Hence, other features can be developed incrementally. Moreover, DSDM facilitates us to provide timeline for each timebox.

Table 3: Second Justification for selecting DSDM.

Justification 3

Case Study Scenario	Altruistic Inc has already developed a product before. The company is planning to develop the system in order to increase their influence in the market. Hence, Altru Drive is responsible for adding value for the company.
Attribute	Make sure that product adds value to the company
Justification	DSDM tends to focus towards the business need of a company. Therefore, developing a suitable product will add value to the company. Hence, DSDM methodology is suitable for this project.

Table 4: Third Justification for selecting DSDM.

Justification 4

Case Study Scenario	The product is said to be used in various departments i.e. Finance, Sales and Marketing, and Human resources. Therefore, the product will be used by variety of the users.
Attribute	Assimilating stakeholder in project
Justification	DSDM highly promotes the collaboration while developing a product. DSDM incorporates right stakeholder for developing a product and Altruistic Inc comprises of engineering team for each region. DSDM role like Business Advisors can provide requirement, advice and feedback from variety of functional team.

Table 5: Fourth Justification for selecting DSDM.

Justification 5

Case Study Scenario	Altruistic Inc has already developed an email management which is their core product line. Also, Altruistic Inc has their own engineering team. So, quality of the product should be maintained.
Attribute	Testing and value delivery of product
Justification	DSDM do not compromise towards value delivery of the product. Therefore, the quality of the products is properly defined and agreed upon before initiating the project. Then, proper testing is carried out and feedback is obtained till the final deployment in DSDM in order to ensure optimum value delivery from the product.

Table 6: Fifth Justification for selecting DSDM.

Justification 6

Case Study Scenario	There is clarity in vision of project. Moreover, functional and non-functional requirements have been defined for the project.
Attribute	Focused on value delivery rather than in documentation
Justification	The company has already developed a product before and requirements for the projects is clear. Hence, the company seems to be focused towards value delivery rather than in documentation of the project. Therefore, documentation of project can be expected to be light weighted due to which DSDM can be an appropriate methodology for this project.

Table 7: Sixth Justification for selecting DSDM.

Justification 7

Case Study Scenario	The position of board members has been properly defined. Also, co-ordination between management team and engineering team have been defined in the case study.
Attribute	Roles and responsibilities of individuals
Justification	DSDM assigns roles and responsibilities for each individual who are involved in the project. Hence, communication between team member plays vital role in development of product. DSDM comprises of a technique called Facilitated Workshop to optimize the team communication and collaboration.

Table 8: Seventh Justification for selecting DSDM.

Reasons for not selecting SSADM

Justification 1

Case Study Scenario	The project needs to be delivered in time. Therefore, starting date, and completion date is to be estimated of the project.
Attribute	Starting and completion date of project
Justification	There is unavailability of measure to defined deadline for the project. It is difficult to track progress in SSADM due to which it's difficult to define the completion date of the project.

Table 9: First Justification for not selecting SSADM.

Justification 2

Case Study Scenario	Board members and management team has been defined for the project of Altru Drive. Moreover, various departments have also been introduced for the project.
Attribute	Roles and responsibilities of individuals
Justification	In SSADM, all the information should be extracted from each individual before starting the project. So, there will not be any further communication in between stakeholders and developer due to which customers might not be satisfied from the end product.

Table 10: Second Justification for not selecting SSADM.

Justification 3

Case Study Scenario	There are various features defined for the project. But there is possibility that some more features can be added at the time of development.
Attribute	Response to change
Justification	SSADM is not positive towards the change during the time of product development. Hence, all the features and requirements should be defined before starting the project. Any further changes during the time of development is not accepted. There is no room for error in SSADM.

Table 11: Third Justification for not selecting SSADM.

Justification 4

Case Study Scenario	Altruistic Inc has already developed a product before. The product Altru Drive is an extend to their product line for email management.
Attribute	Value delivery of project
Justification	SSADM do not welcome changes during the time of development of product. Hence, all the requirements are gathered at first before starting the development. Therefore, due to lack of communication or due to miscommunication while gathering requirement the end product developed using SSADM might not provide optimum satisfaction to the customer.

Table 12: Fourth Justification for not selecting SSADM.

Justification 5

Case Study Scenario	There are various functional and non-functional requirements which has been defined for the project.
Attribute	Deliverables of project
Justification	The functional and non-functional requirements of Altru Drive have not been prioritized due to which all features should be developed at once. Moreover, it is not difficult to identify and emphasize major features for the application. This can also lead to uneven distribution of time for the required features of the application.

Table 13: Fifth Justification for not selecting SSADM.

Conclusion

The appropriate methodology for software development method is selected according to schedule, cost, quality, and the other resources available to the project. In the given case scenario, it is difficult to allocate the time period for development if SSADM is chosen. Hence, if schedule for the project cannot be identified then it's not possible to obtain the cost of the project. Likewise, quality of product cannot be ensured while using SSADM. Therefore, DSDM is chosen since it ensures successful completion of project within the given allocated time, within the budget, and is capable of providing optimum value delivery to the customer.

RACI Matrix

Introduction to RACI Matrix

Delegation is an essential part of the role of a project manager, therefore it is important to identify roles and responsibilities in a project early on (Haughey, 2020). Use of the RACI model can be helpful (Haughey, 2020). As the project manager, it's important that from the beginning you set the expectations of people involved in your project (Haughey, 2020).

A RACI matrix is the simplest, most effective means for defining and documenting project roles and responsibilities (Kantor, 2018). Knowing exactly who is responsible, who is accountable, who needs to be consulted, and who must be kept informed at every step will significantly improve your chances of project success (Kantor, 2018). The RACI matrix is a responsibility assignment chart that maps out every task, milestone or key decision involved in completing a project and assigns which roles are Responsible for each action item, which personnel are Accountable, and, where appropriate, who needs to be Consulted or Informed (Kantor, 2018). The acronym RACI stands for the four roles that stakeholders might play in any project (Kantor, 2018).

Terms of RACI Matrix

Responsible	The person who does the work to achieve the task. They are responsible for getting the work done or making decisions.
Accountable	The person who is the owner of the work. This is the role that responsible is accountable to and approves their work.
Consulted	The people who are supplying project information and with whom there is bidirectional communication. Consulted are the ones who need to give input before the work can be done and signed-off on.
Informed	The people who is kept informed of progress and with whom communication is one-way. They need updates on progress or decisions, but they do not have to be consulted formally, nor do they directly contribute to the task or decision.

Table 14: Terms of RACI matrix.

RACI Matrix on Process Level

Roles / Process	Business Sponsor	Business Visionary	Technical Coordinator	Project Manager	Business Analyst	Team Leader	Solution Developer	Solution Tester	Business Ambassador	Technical Advisor	Business Advisor	Workshop Facilitator	Agile Coach
	Project Level				Solution Development Level					Support Level			
Directing a Project Process	R	R	I	I									
Starting up a Project Process	R	C	C	I	C	I			C				
Initiating a Project Process	R	C	C	R	R	C	I	I	I	C	C		
Controlling a Stage Process	C	C	C	R/A	C	R	I	I	C	C	C		C
Managing Product Delivery Process	I	I	C	I	C	R/A	R/A	R/A		C	C	C	C
Managing a Stage Boundary Process	I	I		R/A		R/A							
Closing a Project	A	C	I	R		I	I	I		I	I		

Table 15: RACI Matric on Process Level.

Directing a Project Process

This process is carried out from the beginning to the ending point of the project. Mainly project boards are responsible for directing a project process. Business Sponsor and Business Visionary are responsible for monitoring and termination of project. Likewise, Technical coordinator and Project Manager are informed about the process.

Starting up a Project Process

In this process a document is developed called Project Mandate in which viability of the project is defined. Here, business sponsor is responsible for consulting with Business visionary, Technical coordinator, and Business Analyst. Also, project manager and team leader of the project is informed in this phase.

Initiating a Project Process

In this process, the business case of the project is analysed. Business sponsor, Project manager and Business Analyst are responsible for carrying out this process with consultation of Business Visionary, Technical coordinator, Team leader, Technical advisors and Business advisor. Now, Solution Developer team is formed. After the formation of solution developer team, the team, Solution Tester and Business Ambassador is informed about the business case of the project.

Controlling a Stage Process

Project Manager is responsible and accountable for controlling the stages in the project. Also, Team Leader is liable for control of the stages that are present in project. Project manger ensures that project is on the right tract and the work is assigned to the solution development team. The stage process is consulted with Business sponsor, Business Visionary, Technical Coordinator, Business Analyst, Business Ambassador, Technical advisor, Business Advisor and Agile coach. solution test. Lastly, Solution Developer and tester are informed about the stage processes.

Managing Product Delivery Process

In this process, the task is carried out by the solution development team as per the requirement making them responsible and accountable for the work. Likewise, Team leader and solution tester are also responsible and accountable for the tasks in this process. The technical and workshop advisors are consulted, and the project level member are kept up-to date with the progress. The task is carried out in DSDM methodology so DSDM coach and workshop facilitator are consulted.

Managing a Stage Boundary Process

In this process, project manager is responsible for providing the information of the performance of the current stage to project board and plan next stage. Hence, Project manager and Team Leader are responsible and accountable in this phase and Business Sponsor and Business Visionary are provided information about the performance of the current stage.

Closing a Project

In this process, the project is officially closed with numerous task which carried out by Project Manager. Project manager consults with Business Visionary for closing the project, Business sponsor are accountable for the given process. Likewise, Technical Coordinator, Team Leader, Solution Developer, Solution Tester, Technical Advisor, and Business Advisor are informed about the closure of the project.

RACI Matrix on Activity Level

This RACI matrix maps the activities of DSDM with the project roles.

Roles / Tasks	Business Sponsor	Business Visionary	Technical Coordinator	Project Manager	Business Analyst	Team Leader	Solution Developer	Solution Tester	Business Ambassador	Technical Advisor	Business Advisor	Workshop Facilitator	Agile Coach
	Project Level				Solution Development Level					Support Level			
1. Pre-Project													
1.1 Identify Role	R/A	C	C										
1.2 Terms of Reference	A	C	C	R	C								
2. Feasibility Study													
2.1 Feasibility Assessment	A/C	C	C	R	R	I			C	C	C		
2.1.1 Identify Benefit	A/C	C	C	R	R	I			C	C	C		
2.1.2 Allocate Cost & Time	A/C	C	C	R	R	I			C	C	C		
2.1.3 Outline Solution	A/C	C	C	R	R	I			C	C	C		
2.2 Outline Plan	A	C	C	R	C								
3. Foundation													
3.1 Determine Business Case	R/A	R	C	C	R				C		C		

3.2 Describe & prioritize requirements	R/A		C	R	I	I	I	C		C		
3.3 Solution Architecture Definition	A	R	C	R/A	I			C		C		
3.4 Development Area Definition												
3.4.1 Solution Review Strategy			R	C	C	C	I	I	I	C	C	
3.4.2 Solution Development Standards		R	A	C	C	C	C	C	C			
3.5 Management Area Definition	A	C	C	R		C					C	C
3.6 Create Delivery Plan	I	A	C	R	C	C	C	C	C			
3.7 Identify Delivery Management Techniques	A	C	C	R	C	I	I	I	I	C	C	
4. Exploration												
4.1 Elaborate Prioritised Requirement List	C		R		R/A	C	C	C				
4.2 Planning Time box		A	A		R	R	R	R				C
4.3 Creating Functional Solution		I	I	I	C	R/A	R/A	R	I		C	C	C
5. Engineering												
5.1 Solution Testing												
5.1.1 Business Acceptance Testing	I			I	C	R/A		R	R			
5.1.2 Technical Testing			I	I		R/A	I	R				
5.2 End of Time box assessment				I	C	R/A	R	R				
6. Deployment												

6.1 Assemble	A	C	I	I		R	R						
6.2 Review	A	C	I	I		R		R	R	C	C		
6.3 Deploy	A	C	I	I		R	R	R	R	C	C		
6.2 End of Project assessment	A	C	C	R		C	C	R	R				
7. Post Project													
7.1 Benefits Assessment	A	R				R			C		C		

Table 16: RACI Matrix on Activity Level.

Pre-Project

Business sponsor identifies project management roles in this phase. The terms of reference are also created in this page. Moreover, Business sponsor is responsible for defining the objectives of the project with the consultation of project manager and business analyst.

Feasibility Study

. Business Analyst is responsible for the feasibility assessment of the project which includes estimates of cost, schedule and time. Business sponsor must ensure that the feasibility study at project level is done with the consultation of each participant. Ambassador for Enterprise and Consultants are also asked for their feedback. Depending on the feasibility study, the project manager is responsible for designing the outline scheme.

Foundation

There are a number of things that Business Case needs to deliver in the process of creation. The Business Analyst, Ambassador, and Consultant meeting involves all staff at project level. Business Analyst are accountable for providing technical and business overview for the project. Therefore, Business Analyst develops and Business Visionary approves Prioritised Requirement List (PRL) ensuring that criteria are consistent with business vision and the information is passed onto the project team. Definition of Solution Architecture is defined by Business Analyst, with consultation of people at business level. With the help of Solution Development Team, Technical Coordinator creates Solution Development Standard and Review Strategy. In addition, the technical team establishes delivery plan. The technical team is also responsible for preparing a strategy for implementation. Delivery management techniques are maintained by Project Manager and Business Analyst.

Exploration

In this phase, Solution development team plans the time boxes are planned. Solution development team develops plans as per the functional requirements, non-functional requirements and useable features that have been defined in the project. Then the product is designed, created and recorded. The software development team develops the product and project manager is informed about the progress in the project. Business acceptance testing strategy is developed in collaboration with Business Analyst, and testing is conducted by solution tester.

Engineering

The prototype is designed to reach the needs of the customer. Hence, business acceptance test plans are developed with consultation of Business Analyst and testing is carried out by solution tester. Moreover, technical test plans are formed and carried out by solution tester. Then, project manager develops deployment plan for the project with consultation of development team and technical coordinator. Then, report is provided to the project board.

Deployment

The solution developer assembles all the resources that are required for the deployment of the project. Then, software tester thoroughly reviews the software in order to ensure that the software meets the requirements and the standards of iteration. After the software is reviewed and finalized, it is approved by the business sponsor and then the actual deployment of software is done.

Post Project

After the software is deployed, benefits assessment is carried out by Business Visionary in order identify effectiveness of the solution which has been deployed.

Project Plan

Team Structure
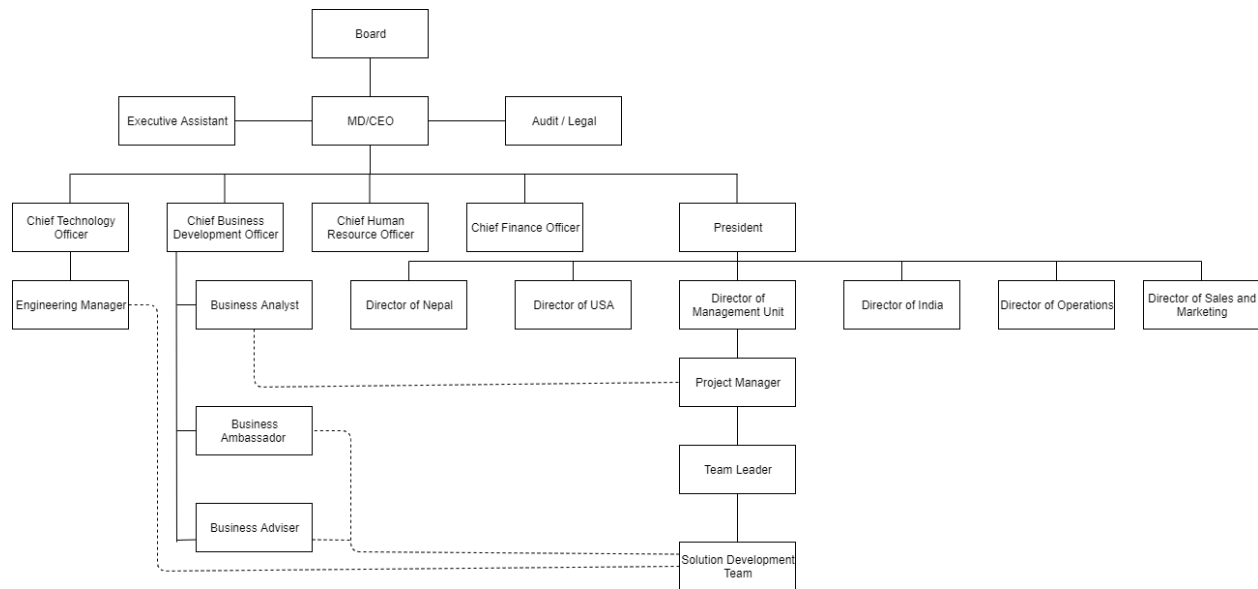
Figure 7: Team Structure.

The above diagram illustrates detailed project management team structure of the organization.

Team Role Description

Name	Organisational Role	Project Role
Susanne Cruise	Chairperson of the Board	
Samantha Richards	CEO	Business Sponsor
Peter Bono	Chief Technology Officer	Technical Coordinator
James Seligman	Chief Financial officer	
Amar Pandey	Chief Business Development Officer	Business Visionary
Mandel Coleman	Chief Human Resource Officer	
Agnes Robbins	Director of Sales and Marketing	
Martin Peron	Director of Project Management	
Bob Thomas	Director of Operations	
Leila Solomon	President -USA	
Dinesh Chopra	President -India	
Ankita Raut	President -Nepal	
Hrishav Tandukar		Project Manager

Table 17: Team Role Description in an organization.

The Board and Chairperson of the Board, Susanne Cruise will act as the Project Governance Authority for this project. CEO of company, Samantha Richards will be the business sponsor for this project and is responsible for the success of the project. Chief Technology Officer, Peter Bono will be governing the technical aspect project and will act as a Technical Coordinator for the project. Under the supervision of Technical Coordinator, the engineering team on will develop the product. For this project, the engineering manager also acts as the technical advisor. Amar Pandey, Chief Business Development Officer, is the business visionary who will work for the product's vision.

Business analyst, Ambassador and Business advisors will work under the visionary in context to the need of company. I, Hrishav Tandukar am the project manager of Nepal who will be reporting to the Director of Nepal and will be working under the Director of Management Unit of Nepal. Team Leader and Solutions Development Team will be reporting me regarding the day to day management of progress. Likewise, Business Analyst, Business Ambassador, Solution Development Team will develop product which is expected to meet the vision of the Business Visionary.

User Stories

S.N.	User Story
1.	As a user, I want to create folders and sub folders in cloud so I can store information in organized way.
2.	As a user, I want to upload files within folders, so I can arrange files within the folders.
3.	As a user, I want to share the files and folders present in the cloud so other users can view and have accessed to the shared files.
4.	As a user, I want to delete file and folders permanently so that unwanted files can be permanently removed from cloud storage.
5.	As a user, I want to send the files to trash so that unnecessary files can be sent to trash.
6.	As a user, I want email notification when files or folders are shared so that I can obtain information about files that have been shared to me.
7.	As a user, I can only access the files that have been shared so that privacy of each individual is maintained.
8.	As a team, we want to download the shared files so that we can have access to only those files which has been shared to us.
9.	As a user, I want to view a list of recent documents that has been accessed today, last week, last month, last year accordingly so that I can open easily recently files and open files according to the date.
10.	As a user, I want the option of viewing photos or videos so that I can view photos or videos without using any external plugins.
11.	As a user, I want viewing contents in list, detail and icon view so that I can view the content list as per my preference.

12.	As a user, I want marking items as favourites and view them so that I can mark my important files that are present in the cloud.
13.	As a user, I want to search for files and folders so I can easily access the files according to the name of the file.
14.	As a user, I want to sort file and folders by Name, Date, Type so I can view the files as per its name, uploaded date or file type.
15.	As a user, I want to recover data from trash so that I can move files into trash in case if file is not required for the time being but access and restore files in case of necessity in the future.
16.	As a team, we want the feature of Auto backup and Recovery so that in case of loss of important files, it can be recovered.
17.	As a team, we want a team space where team member can share ideas and create time plans so that it easy to search the tasks and collaborate with the team.
18.	As a system admin, I want to block users who have violated terms and condition for using the cloud storage so that users do not violate rules and regulations.
19.	As a system admin, I want to grant privilege to user as per package which has been selected so that users obtain services of Altru drive as per the agreement carried out for selecting a package.
20.	As an admin, I want to develop teams with different people so that each individual can use Altru Drive to collaborate.
21.	As an admin, I want to add new user to Altru Drive so that the new user can also have access to the file.
22.	As an admin, I want to remove user from collaborated document so that user list remains updated.

23.	As a user, I want two factor authentications so that there is optimum data security.
24.	As a Product Owner, I want the service to endure disasters so that user can get optimum satisfaction while using Altru drive and face minimum downtime.
25.	As an admin, I want user to create strong password which is encrypted so that security is maintained and there is less probability of cracking of password by others.
26.	As an admin, I want to allow user to add and change password so that they can select their own password in order to lock files.
27.	As a Technical manager, I want the capability to increase server nodes so that the service of Altru drive can run smoothly even during heavy load (up to 100,00 users).
28.	As a Technical Manager, I want to distribute load to multiple server nodes so that it can improve service responsiveness and, switch, search should not be above 3 seconds.
29.	As a user, I want the option of multi-language support so I can view contain in an efficient and interactive way.
30.	As a user, I want to change password of my account so I can change password in case if I forget my password or in case if I want to update my password for security reasons.

Table 18: User Stories as per the case scenerio.

Prioritization and Estimation

DSDM's success is due to the philosophy "that any project must be aligned to clearly defined strategic goals and focus upon early delivery of real benefits to the business." DSDM is vendor-independent, covers the entire lifecycle of a project and provides best practice guidance for on-time, in-budget delivery of projects, with proven scalability to address projects of all sizes and for any business sector. (Consortium, 2019)

MoSCoW is a prioritisation technique for helping to understand and manage priorities. The letters stand for:

- Must Have
- Should Have
- Could Have
- Won't Have this time (Consortium, 2019)

The MoSCoW Rules

Must Have

These provide the Minimum Usable SubseT (MUST) of requirements which the project guarantees to deliver. These may be defined using some of the following:

- No point in delivering on target date without this; if it were not delivered, there would be no point deploying the solution on the intended date
- Not legal without it
- Unsafe without it
- Cannot deliver a viable solution without it (Consortium, 2019)

Ask the question 'what happens if this requirement is not met?' If the answer is 'cancel the project – there is no point in implementing a solution that does not meet this requirement', then it is a Must Have requirement. If there is some way around it, even if it is a manual and painful workaround, then it is a Should Have or a Could Have requirement. Categorising a requirement as a Should Have or Could Have does not mean it won't be delivered; simply that delivery is not guaranteed. (Consortium, 2019)

Should Have

Should Have requirements are defined as:

- Important but not vital
- May be painful to leave out, but the solution is still viable
- May need some kind of workaround, e.g. management of expectations, some inefficiency, an existing solution, paperwork etc. The workaround may be just a temporary one (Consortium, 2019)

One way of differentiating a Should Have requirement from a Could Have is by reviewing the degree of pain caused by the requirement not being met, measured in terms of business value or numbers of people affected. (Consortium, 2019)

Could Have

Could Have requirements are defined as:

- Wanted or desirable but less important
- Less impact if left out (compared with a Should Have) (Consortium, 2019)

These are the requirements that provide the main pool of contingency, since they would only be delivered in their entirety in a best case scenario. When a problem occurs and the deadline is at risk, one or more of the Could haves provide the first choice of what is to be dropped from this timeframe. (Consortium, 2019)

Won't Have this time

These are requirements which the project team has agreed will not be delivered (as part of this timeframe). They are recorded in the Prioritised Requirements List where they help clarify the scope of the project. This avoids them being informally reintroduced at a later date. This also helps to manage expectations that some requirements will simply not make it into the Deployed Solution, at least not this time around. Won't Haves can be very powerful in keeping the focus at this point in time on the more important Could Haves, Should Haves and particularly the Must Haves. (Consortium, 2019)

Ensuring Effective Prioritization

When deciding the effort allocated for Must Have requirements, remember that anything other than a Must Have is, to some degree, contingency, since the Must Haves define the Minimum Usable SubseT which is guaranteed to be delivered. (Consortium, 2019)

DSDM recommends:

- Getting the percentage of project/Project Increment Must Haves (in terms of effort to deliver) to a level where the team's confidence to deliver them is high – typically no more than 60% Must Have effort (Consortium, 2019)
- Agreeing a pool of Could Haves for the project/Project Increment that reflects a sensible level of contingency - typically around 20% Could Have effort. Creating a sensible pool of Could Haves sets the correct expectations for the business from the start – that these requirements/User Stories may be delivered in their entirety in a best case scenario, but the primary project/Project Increment focus will always be on protecting the Must Haves and Should Haves (Consortium, 2019)

This spread of priorities provides enough contingency to ensure confidence in a successful project outcome. (Consortium, 2019)
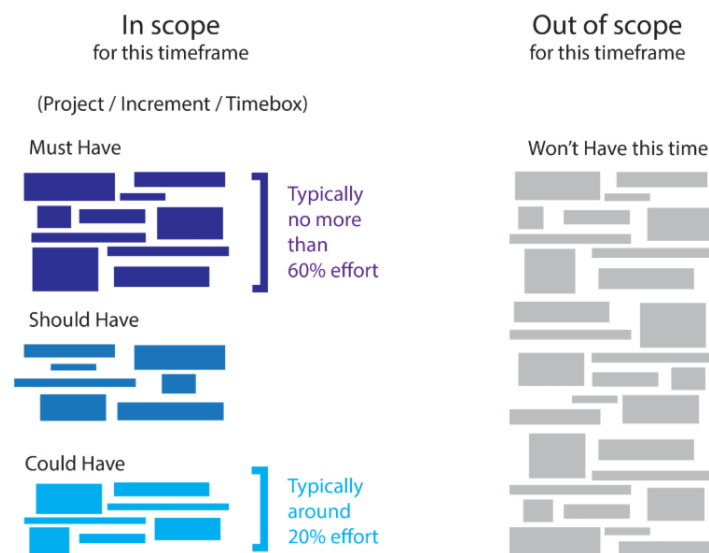
Figure 8: MoSCoW – balancing priorities (Consortium, 2019)

The above figure represents the MoSCoW balancing the priorities.

MoSCoW Prioritization of Altru Drive

Must Have

Priority	ID	User Story	Story Point
Must Have	M01	As a user, I want to create folders and sub folders in cloud so I can store information in organized way.	5
	M02	As a user, I want to upload files within folders, so I can arrange files within the folders.	5
	M03	As a user, I want to share the files and folders present in the cloud so other users can view and have accessed to the shared files.	5
	M04	As a user, I want to delete file and folders permanently so that unwanted files can be permanently removed from cloud storage.	5
	M05	As a user, I want to send the files to trash so that unnecessary files can be sent to trash.	1
	M06	As a system admin, I want to block users who have violated terms and condition for using the cloud storage so that users do not violate rules and regulations.	8
	M07	As a system admin, I want to grant privilege to user as per package which has been selected so that users obtain services of Altru drive as per the agreement carried out for selecting a package.	5
	M08	As a Technical manager, I want the capability to increase server nodes (up to 100,00 users).	21

		Installation of server so that I can deploy the application in the server.	
	M09	As a Technical Manager, I want to distribute load to multiple server nodes so that it can improve service responsiveness and, switch, search should not be above 3 seconds.	21
	M10	As a user, I want to change password of my account so I can change password in case if I forget my password or in case if I want to update my password for security reasons.	2

Table 19: Must Have details of MoSCoW prioritization of Altru Drive.

Should Have

Priority	ID	User Story	Story Point
Should Have	S01	As a user, I can only access the files that have been shared so that privacy of each individual is maintained.	5
	S02	As a team, we want to download the shared files so that we can have access to only those files which has been shared to us.	3
	S03	As a user, I want the option of viewing photos or videos so that I can view photos or videos without using any external plugins.	3
	S04	As a user, I want to search for files and folders so I can easily access the files according to the name of the file.	5
	S06	As a user, I want to recover data from trash so that I can move files into trash in case if file is not required for the time being but access and restore files in case of necessity in the future.	5
	S07	As a team, we want the feature of Auto backup and Recovery so that in case of loss of important files, it can be recovered.	8
	S08	As an admin, I want to develop teams with different people so that each individual can use Altru Drive to collaborate.	3

	S09	As an admin, I want to add new user to Altru Drive so that the new user can also have access to the file.	5
	S10	As an admin, I want to remove user from collaborated document so that user list remains updated.	5

Table 20: Should Have details of MoSCoW prioritization of Altru Drive.

Could Have

Priority	ID	User Story	Story Point
Could Have	C01	As a user, I want email notification when files or folders are shared so that I can obtain information about files that have been shared to me.	3
	C02	As a user, I want to sort file and folders by Name, Date, Type so I can view the files as per its name, uploaded date or file type.	2
	C03	As a user, I want to view a list of recent documents that has been accessed today, last week, last month, last year accordingly so that I can open easily recently files and open files according to the date.	5
	C04	As a user, I want viewing contents in list, detail and icon view so that I can view the content list as per my preference.	5
	C05	As a user, I want marking items as favourites and view them so that I can mark my important files that are present in the cloud.	2
	C06	As a team, we want a team space where team member can share ideas and create time plans so that it easy to search the tasks and collaborate with the team.	2
	C07	As an admin, I want user to create strong password which is encrypted so that security is maintained	3

		and there is less probability of cracking of password by others.	
	C08	As an admin, I want to allow user to add and change password so that they can select their own password in order to lock files.	1

Table 21: Could Have details of MoSCoW prioritization of Altru Drive.

Won't Have This Time

Priority	ID	User Story	Story Point
Won't Have this time	W01	As a user, I want the option of multi-language support so I can view contain in an efficient and interactive way.	8
	W02	As a user, I want two factor authentications so that there is optimum data security.	8
	W03	As a Product Owner, I want the service to endure disasters so that user can get optimum satisfaction while using Altru drive and face minimum downtime.	21

Table 22: Won't Have details of MoSCoW prioritization of Altru Drive.

Timebox Planning

The solution team comprises of nine members in order to carry out the development task. A timebox is developed for 4 weeks or 24 working days. In past, the average velocity of our solution has been 26 story points per timebox. Hence, for this project our team will start with 26 story point per timebox and plan the timebox accordingly.

Time Box: 1

ID	User Story	MoSCoW	Story Points	Remarks
M06	As a system admin, I want to block users who have violated terms and condition for using the cloud storage so that users do not violate rules and regulations.	Must	8	
M07	As a system admin, I want to grant privilege to user as per package which has been selected so that users obtain services of Altru drive as per the agreement carried out for selecting a package.	Must	5	
M01	As a user, I want to create folders and sub folders in cloud so I can store information in organized way.	Must	5	
M04	As a user, I want to delete file and folders permanently so that unwanted files can be permanently removed from cloud storage.	Must	5	
M05	As a user, I want to send the files to trash so that unnecessary files can be sent to trash.	Must	1	
M10	As a user, I want to change password of my account so I can change password in case if	Must	2	

	I forget my password or in case if I want to update my password for security reasons.			

Table 23: TimeBox One

Objective of Time Box 1

   Deploy a working product in which system admin can restrict and grant privilege to users and users can create various files and folders using product.

Time Box: 2

ID	User Story	MoSCoW	Story Points	Remarks
M08	As a Technical manager, I want the capability to increase server nodes so that the service of Altru drive can run smoothly even during heavy load (up to 100,00 users).	Must	21	
M02	As a user, I want to upload files within folders, so I can arrange files within the folders.	Must	5	

Table 24: Timebox Two

Objective of Time Box 2

Incremental update in which server nodes are added in order to run product even during the time of heavy traffic and also allow users to upload file in the developed product.

Time Box: 3

ID	User Story	MoSCoW	Story Points	Remarks
M09	As a Technical Manager, I want to distribute load to multiple server nodes so that it can improve service responsiveness and, switch, search should not be above 3 seconds.	Must	21	
M03	As a user, I want to share the files and folders present in the cloud so other users can view and have accessed to the shared files.	Must	5	

Table 25: Timebox Three

Objective of Time Box 3

Incremental update in which responsiveness of product is optimized and users are allowed to share files and folders.

Time Box: 4

ID	User Story	MoSCoW	Story Points	Remarks
S01	As a user, I can only access the files that have been shared so that privacy of each individual is maintained.	Should	5	
S02	As a team, we want to download the shared files so that we can have access to only those files which has been shared to us.	Should	3	
S06	As a user, I want to recover data from trash so that I can move files into trash in case if file is not required for the time being but access and restore files in case of necessity in the future.	Should	5	
S04	As a user, I want to search for files and folders so I can easily access the files according to the name of the file.	Should	5	
S07	As a team, we want the feature of Auto backup and Recovery so that in case of loss of important files, it can be recovered.	Should	8	

Table 26: Timebox Four

Objective of Time Box 4:

Incremental update in which product comprises of Auto backup and trash feature, also, file sharing is optimized with download feature added to user.

Time Box: 5

ID	User Story	MoSCoW	Story Points	Remarks
S08	As an admin, I want to develop teams with different people so that each individual can use Altru Drive to collaborate.	Should	3	
S09	As an admin, I want to add new user to Altru Drive so that the new user can also have access to the file.	Should	5	
S10	As an admin, I want to remove user from collaborated document so that user list remains updated.	Should	5	
S03	As a user, I want the option of viewing photos or videos so that I can view photos or videos without using any external plugins.	Should	3	
C04	As a user, I want viewing contents in list, detail and icon view so that I can view the content list as per my preference.	Could	5	
C05	As a user, I want marking items as favourites and view them so that I can mark my important files that are present in the cloud.	Could	2	
C07	As an admin, I want user to create strong password which is encrypted so that security is maintained and there is less probability of cracking of password by others.	Could	3	

Table 27: Timebox Five

Objective of Time Box 5

Incremental update in which users can be added and removed from the collaborated file, and photos or views can be opened and marked favourite. Also, the passwords of each individuals are encrypted in order to maintain data security

Time Box: 6

ID	User Story	MoSCoW	Story Points	Remarks
C01	As a user, I want email notification when files or folders are shared so that I can obtain information about files that have been shared to me.	Could	3	
C02	As a user, I want to sort file and folders by Name, Date, Type so I can view the files as per its name, uploaded date or file type.	Could	2	
C03	As a user, I want to view a list of recent documents that has been accessed today, last week, last month, last year accordingly so that I can open easily recently files and open files according to the date.	Could	5	
C06	As a team, we want a team space where team member can share ideas and create time plans so that it easy to search the tasks and collaborate with the team.	Could	2	
C08	As an admin, I want to allow user to add and change password so that they can select their own password in order to lock files.	Could	1	

Table 28: Timebox Six

Objective of Time Box 6

Incremental update of product in which email notifications are provided, viewing of files are made more efficient and secure, and a separate space is created in order to carry out discussion for a team.

Project Plan

S.No.	Activity	Deliverable	Start Date	End Date	Duration (Working Days)	Resource
1.	**Pre-Project Phase**	**TOR and Budget Allocation Report**	**01/01/2020**	**06/01/2020**	**5 days**	
1.1	Identify roles of Individuals		01/01/2020	01/01/2020	1 day	
1.2	Prepare Term of Reference (TOR)	TOR	02/01/2020	03/01/2020	2 days	Business Sponsor
1.3	Budget Allocation	Budget Allocation Report	05/01/2020	06/01/2020	2 days	Business Sponsor
2.	**Project Phase life Cycle**	**Feasibility Study Report, Prioritized list of Requirement and SRS.**	**07/01/2020**	**31/01/2020**	**23 days**	
2.1	**Feasibility Study**	**Feasibility Study Report**	**07/01/2020**	**17/01/2020**	**10 days**	
2.1.1	Market Feasibility	Market Research Report	07/01/2020	08/01/2020	2 days	Business Sponsor, Business Visionary
2.1.2	Technical Feasibility	Technical Requirements	09/01/2020	10/01/2020	2 days	Technical Coordinator

		and Feasibility Report				, Project Manager
2.1.3	Financial Feasibility	Cost Approximation Report	12/01/2020	13/01/2020	2 days	Business Sponsor, Business Analyst, Business Visionary
2.1.4	Time Feasibility	Time Allocation Report	14/01/2020	15/01/2020	2 days	Business Sponsor, Business Analyst
2.1.5	Research and Conformation of Methodology	Methodology Comparison Report	16/01/2020	17/01/2020	2 day	Project Manager, Agile Coach
2.2	**Foundation**	**Prioritized List of Requirements and SRS Document**	**19/01/2020**	**31/01/2020**	**12 days**	
2.2.1	Identify and Define Scope of Project		19/01/2020	20/01/2020	2 day	Business Sponsor, Business Visionary, Business Analyst
2.2.2	Interview with Client		21/01/2020	22/01/2020	2 days	Business Analyst
2.2.3	Determining Functional, Non-Functional		23/01/2020	24/01/2020	2 day	Technical Coordinator

	Requirements and Useable features					, Business Analyst
2.2.4	Defining User stories		26/01/2020	28/01/2020	3 day	Business Analyst
2.2.5	MoSCoW Prioritization		29/01/2020	31/01/2020	3 day	Business Analyst, Agile Coach
3.	**Time Box 1**		**02/02/2020**	**29/11/2020**	**24 days**	
3.1	**Exploration**	**Graphic Designs and Activity Flow Diagrams**	**02/02/2020**	**09/02/2020**	**7 days**	
3.1.1	Selection of tool for UI design		02/02/2020	02/02/2020	1 day	Technical Coordinator , Team Leader
3.1.2	Identify/Design UI	Wireframes	03/02/2020	04/02/2020	2 days	Technical Coordinator , Team Leader, Solution Developer
3.1.3	Chosen UI/UX Concept	Graphic Design	05/02/2020	05/02/2020	1 days	Technical Coordinator , Team Leader, Solution Developer
3.1.4	Identify Attributes of product		06/02/2020	06/02/2020	1 day	Technical Coordinator , Team

						Leader, Solution Developer, Business Analyst
3.1.5	Final Layout Concept	Activity Flow Diagram	07/02/2020	09/02/2020	2 days	Technical Coordinator , Team Leader, Solution Developer
3.2	**Design and Build Integration**	**Web Application Development, Solution Assurance Plan, Deployment Plan**	**10/02/2020**	**25/02/2020**	**14 days**	
3.2.1	Division of Design		10/02/2020	10/02/2020	1 day	Technical Coordinator , Team Leader, Solution Developer, Project Manager
3.2.2	CSS/JavaScript Integration		10/02/2020	12/02/2020	3 days	Team Leader, Solution Developer

3.2.3	Web Application Design	Framework	13/02/2020	13/02/2020	1 day	Team Leader, Solution Developer
3.2.4	Database Design and Development		13/02/2020	14/02/2020	2 days	Team Leader, Solution Developer
3.2.5	Web App Development		11/02/2020	21/02/2020	10 days	Team Leader, Solution Developer
3.2.6	Solution Testing	Solution Assurance Plan	23/02/2020	23/02/2020	1 day	Team Leader, Solution Developer
3.2.6.1	Business Acceptance Testing		24/02/2020	24/02/2020	1 day	Team Leader, Solution Developer
3.2.6.2	Technical Testing		25/02/2020	25/02/2020	1 day	Team Leader, Solution Developer
3.2.7	Planning Deployment Phase	Deployment Plan	25/02/2020	25/02/2020	1 day	Technical Coordinator, Team Leader, Solution Developer,

				Start	End	Duration	Resources
							Project Manager
3.3	**Deployment**			26/02/2020	29/02/2020	**3 day**	Technical Coordinator , Team Leader, Solution Developer, Project Manager
3.3.1	Webhosting/ Domain Registration			26/02/2020	26/02/2020	1 day	Team Leader, Solution Developer
	Database Server			26/02/2020	29/02/2020	3 days	Team Leader, Solution Developer
	Final Review			27/02/2020	28/02/2020	2 days	Solution Tester, Business Analyst, Technical Coordinator
	Deploy Solution	Deployed Solution		28/02/2020	28/02/2020	1 day	Solution Developer
	End of Time Box Assessment	Timebox Review Report		29/02/2020	29/02/2020	1 day	Agile Coach, Project Manager
4.	**Time Box 2**			**02/03/2019**	**31/03/2019**	**24 days**	

4.1	The tasks of this time box are similar as the time box1.					
5.	**Time Box 3**		**01/04/2019**	**30/04/2020**	**24 days**	
5.1	The tasks of this time box are similar as the time box1.					
6.	**Time Box 4**		**01/05/2020**	**31/05/2020**	**24 days**	
6.1	The tasks of this time box are similar as the time box1.					
7.	**Time Box 5**		**01/06/2020**	**30/06/2020**	**24 days**	
7.1	The tasks of this time box are similar as the time box1.					
8.	**Time Box 6**		**01/07/2020**	**31/07/2020**	**24 days**	
8.1	The tasks of this time box are similar as the time box1.					
9.	**Implementation**		**02/08/2020**	**14/08/2020**	**12 days**	
9.1	User Approvals and Guidelines		02/08/2020	04/08/2020	3 days	Solution Tester
9.2	Train Individual Users		05/08/2020	07/08/2020	3 days	Business Advisor, Technical Advisor, Business Analyst
9.3	Implementation/Setup	User Manual	09/08/2020	11/08/2020	3 days	Technical Coordinator, Solution Developer
9.4	Business Review		12/08/2020	13/08/2020	2 day	Business Analyst

9.5	Final Delivery of Product		14/08/2020	14/08/2020	1 day	Business Sponsor, Project Manager
10.	**Post – Project**		**16/08/2020**	**21/08/2020**	**6 days (On Going)**	
10.1	Benefit Assessment	Benefit Assessment	16/08/2020	21/08/2020	6 days	Business Analyst, Project Manager, Business Sponsor, Business Visionary
10.2	Maintenance		On going	On going		Team Leader, Technical Coordinator

Table 29: Project Plan for Altru Drive.

Assumptions for developing project plan

- Total number of working days per week is considered as 6.

- Saturday is not calculated in project plan.

- The team size is defined as 9.

- The past average velocity of team is considered as 26 Story Points.

- All the time boxes have been executed as per the planning.

- In case if any time box needs to be reviewed it is adjusted in upcoming time box.

- In last timebox, the story point is only 13 therefore, in case if any timebox is not completed as planned then it can be adjusted accordingly.

- In terms of time box containing user story point as 21, it can be further divided into sub stories while carrying out the given task.

Deliverables

TOR

Terms of Reference (TOR) is used to specify the amount and type of work to be accomplish the project. TOR comprises of a range of criteria that are essential for strategic project decision making. (Mcconnell, 2012)

Budget Allocation Report

A budget is a financial plan that is used to estimate revenue and expenses over a given period. A budget allocation is the amount of funding allocated for each line of spending. This determines the maximum amount of funding that an agency is willing to spend on a given item or program, and it is a cap not to be reached by the individual who is allowed to incur expenditures on a specific budget line. Budget Allocation report is a formal document which comprises of budget details for a project. (Ryckman, 2019)

Feasibility Study

Feasibility Study is used to analyse the viability of an idea ensuring that a project is technically, economically, legally, operationally and scheduling feasible in a particular market.

Prioritized list of Requirement

Prioritized list of requirements ensures that vital features that are required for the project are completed in the early days of the project.

SRS

A (Software Requirements Specification) SRS is used to describe the functionality product need to all stakeholders. SRS document also defines how the software interacts when embedded with hardware. (Krüger, 2018)

Graphic Designs

Graphic design are developed in order to help developers visualize how the actual product looks like.

Activity Flow Diagrams

Activity flow diagram is used to present the flow of one activity to another activity. It is generally used to defined dynamic aspects of the product.

Solution Assurance Plan

Solution Assurance Plan comprises of Business Acceptance test cases and Technical test unit records.

Deployment Plan

Deployment plan consists of detailed planning for operating a product after the development task is carried out.

Deployed Solution Report

Deployed solution report includes details to the system which is now fully operational.

Timebox Review Report

Timebox Review Report comprises of review of timebox in order to ensure that all story points have been obtained. Hence, in case if any story point has not been met, it is included in another time box.

User Manual

User Manual comprises of detailed briefing for using the system.

Benefit Assessment

Benefit Assessment document is developed so as to identify the effectiveness of the deployed solution. It also summarizes how the solution minimizes the problem which had been identified before development of the software.

Altru Drive

Project Brief

Document Information

Project Name: Altru Drive (File Storage and Management System)

Date: 1st January 2020

Author: Hrishav Tandukar, Project Manager

Owner:

Client: Altruistic Inc

Document Code: 001

Version: V1

Note: this document may not be valid anymore. Please check the configuration management system for the latest approved version of the document.

Approval

Date	Name & Signature

Contents

Project definition

BACKGROUND

Altruistic Inc is a large multinational company which has its branches located in USA, India and Nepal. The headquarter of Altruistic is located at USA. The administrative department in USA comprises of Finance, Sales and marketing and Human Resources. Each development centre of Altruistic Inc has their own management team. Each development centre has local president who lead the management team along with the engineering teams of the project. The company had been involved in developing Email Management system and has already developed the system. Hence, due to lack of capability to send file of high file size, company has now decided to extend their product line by adding a new product "Altru Drive" for file storage. For the time being, it is difficult for the individuals to work on a single file which could lead to problem in management and miscommunication among team members. The intended product "Altru Drive" is a cloud file storage and management system which can overcome the management problems and remove traditional technique for communication among team members. Hence, Altru Drive is to be integrated with its core product line i.e. Email Management system. Furthermore, the product can be helpful in notifying users about task, planning purposes, and carry out group discussions.

PROJECT OBJECTIVE

The main objectives of this project are as follows:

- **Objective 1:** The project commences from 1st January 2020 and is to be completed before 1st September 2020.
- **Objective 2:** Successfully complete project with the cost of $27,000.
- **Objective 3:** Develop project with continuous testing and feedback for obtaining maximum value delivery.
- **Objective 4:** Cultivate project which provides user friendly environment and enhances user experience.
- **Objective 5:** Make sure that project is beneficial for different functional divisions of an organization.
- **Objective 6:** Ensure that the project benefits the company's growth in the years to come by increasing productivity and sales.

DESIRED OUTCOMES

The desired results of this project are to deliver a product that can allow its user to easily create, share and collaborate. The outcomes that are desired for the project are as follows:

- **Outcome 01:** The product will permit its users to create and organize documents.
- **Outcome 02:** The product will let people and team to upload and manage files.
- **Outcome 03:** The product will allow user to carry out group discussions and allocate task among team members.
- **Outcome 04:** The product will let users to search, sort, display files as per the convenience of user.
- **Outcome 05:** The product will be integrated with its core product line i.e. Email Management system.
- **Outcome 06:** The product will allow its user and teams to collaborate and work together in a single document.
- **Outcome 07:** The product will allow users to provide backup and recovery feature.

PROJECT SCOPE AND EXCLUSIONS

Project Scope

The project's reach is to address the business issues which have been stated above. The aim is to build a file storage and management system in which users can access and manage files / folders in their spaces, work together on the same content and label objects as favourites. The project is implemented in order to overcome the poor handling and management of files / folders and to allow collaborative teamwork. Different functional divisions of an organization can use the product according to their needs. The project can handle multiple users at a time and backup of files are maintained in order to minimalize data loss.

The high-level description of deliverables covered by the scope of the project are as follows:

Components	Description
Uploading and Managing Files/Folders	Create folders, upload files and share them with other users in the provided cloud storage.
Viewing and Searching Contents	Options of viewing the items. Search and filter functionality with different options, like name, date, size, and type.
Backup and Recovery	Manual Backup or periodic automatic backup based on configuration settings.
Feedback and Collaborative work	Provide feedback and carry out collaborative work based on group discussions.

Table 30: High-level description of deliverables covered by the scope of the project.

Exclusions

The above mentioned are the scope of the project. The components which are not included in the scope of project and are excluded are as follows:

- The product does not comprise of multiple server in order to minimize the server downtime problem.
- The product will not be available for in multiple languages.
- The product does not contain encryption for managing confidential documents.

The project is to be developed by the engineering team of Nepal. The engineering team of USA and Indian will not be involved in the project. All the required human resource for the project is already present in Nepal. Hence, new peoples should not be recruited for the project.

Constraints and Assumptions

There are loops holes or limitations present in the given project. Therefore, team should be capable of working in those limitations. The constraints of limitations are applied to the scope, cost and time of the project. The constraints of limitations are interrelated to each other. Therefore, if any changes are made to any one of them, it can influence the purpose of the project.

- **Scope**

    The scope of the project has already been stated above. The team will be working on the scope as defined and in case of any changes in scope which is can be done by stakeholders, the project plan, time and budget will be changed accordingly.

- **Cost**

    There are total nine members in the project. Each member is estimated to be paid around $350. The project is estimated to carried out for eight months. Moreover, server and other miscellaneous expenses are also required for the project which is estimated to be around $27,000. The cost of resources or change in quality of work can be the responsible factors for change in budget. Also, budget cut off could affect the project objective.

- **Time**

    The project is estimated to commence from 1st January 2020 and is expected to be completed before 1st September 2020. The time estimation has been carried out in consideration of multiple factors, but some factors such as employee turnover, lack of availability of resources, outside interference and lead to change in time and can hamper the project objective.

    Assumptions which are made during planning of the project are as follows:

- It is assumed that basic resources such as workstation, materials, internet, electricity are available to complete the project.
- It is assumed that the team members are highly motivated individuals who are willing to work on this project.
- It is assumed that resources which are required for the project shall be provided as per the demand of the resource.
- It is assumed that the team is a self-organizing team.
- It is presumed that the team members are specialized on their field.
- It is presumed that the team leader will be following the DSDM ceremonies.

Project Tolerances

The degree of tolerance shall be set for costs, time, scope, quality benefits and risks. If the constraint falls within the tolerance level, there will be no need to escalate to higher management.

- **Cost**

    DSDM solution addresses the costs. Any difference would necessitate higher management interference.

- **Time**

    DSDM solution always have fixed time. Any variance would necessitate higher management interference.

- **Scope**

    As the project will take approximately 6 months to complete, a slight variation in scope is tolerable to ensure the scope is not obsolete over time.

- **Quality**

    Quality variance is not tolerable as in DSDM, standards are set at the planning stage and are strictly adhered to throughout the project.

- **Benefit**

    Tolerance in benefit variability is set to a minimum and should be reported to management if significant variation is observed.

- **Risk**

    Risk: the level of risk tolerance is set to low and, if something above that level is seen, it is reported to the management.

The User(s) and Any other Known Interested Parties

All the stakeholders are informed about the initiation, development and completion of the project. The stake holder includes board member, Chief Executive Officer, Chief Technology Officer, Chief Financial Officer, Directors, President, Engineering team and the customer who are going to use the product.

Interfaces

After completion of the project, the components will be impacted or will need to change.

- User manuals and brochures that include this product will need to be revised.
- Sales team will need to be prepared to give employees or customers a demo and pitch the product.
- Marketing team will need to launch a product marketing plan.

Outline business case

REASON

Altruistic Inc. is a major Australian-based development company. It has its branches in Nepal, the US, and India in order to carry out development activities. The company has already produced a few products in its line of products. Email Management System is one of the products of Altruistic Inc. Further in order to broaden the product line and accelerate the company's growth, Altruistic Inc. plans to develop and add new product to its existing product line up. Atru Drive is a shared communication system that will help overcome a number of problems that occur in an enterprise related to project management and, exchange, sharing and collaboration of documents.

Although, Email management had been developed by Altruistic Inc. it must have been difficult to send files with high file size. File sharing and collaboration is difficult to carry out in the organization. Individuals are unable to share and work on a document collaboratively. Hence, there is significantly high chances of miscommunication between team members while working on a document. Also, documents cannot be organized in an organized way. Therefore, in order to minimize these issues Altro Drive is to be developed. In Altro Drive, individuals can work collaboratively work on a single document by sharing the required files and the users will also obtain notification about the tasks that are to be carried out in the document. Group discussion can also be carried out in order to exchange ideas and thoughts. Hence, the product will provide a competitive advantage to the company and help company obtain a significant position in the market.

BENEFTS EXPECTED

The benefits which are expected by Altruistic Inc. from this product are as follows:

- The product will provide competitive advantage to the company in market.
- The product will help company provide significant position in the market due to variety of features included in product.
- The company will obtain recognition for versatile product development.
- The product will help company minimize internal management and communication issues.
- The product will play vital role for the growth of the company.
- The development of new product will add a product to the product line and portfolio of the company.
- The product will help company to retain their old and new customers.
- The product will also be used to manage, share and collaborate on a file.

The several benefits expected from products are as follows:

- The product will allow users to create files and organize files in folders.
- The product will allow users to view photos and videos without using external plugins.
- The product permits user to discuss and work collaboratively on a file.
- The product allows auto backup and recovery of files.
- The product facilitates viewing and searching of files and folders in an efficient way.

RISKS

Following mentioned are some of the immediate risks that are to be analysed after the project is approved:

- There are chances of employee turnover which delays the project.
- A feasibility study can take longer than expected leading to late project launch.
- Inaccurate time, expense and scope team estimates.
- Stakeholders with imprecise project understanding and goals.
- Communication gaps between project board and development team.
- Delay in the procurement and refund process.

COST

The project is to be carried out by nine team members. The budget allocated for carrying out the project is $27,000. The calculation of budget for carrying out the project has been shown below:

Cost estimation

= Number of team members * Time Period * Amount of payment + Other expenses

= 9 * 8* 350 + 1800

= $27,000

Hence, total estimated budget for the project is around $27,000. Here, other expenses refer to devices and servers that can be required for the project.

TIME

The project is expected to start from 1st January 2019. The developed of project will be carried out incrementally according to the timeboxes. There are total six timeboxes developed for the project. Each timebox has been planned for four weeks of time interval. The detailed planning of project has been shown in project plan.

Project product description

Quality Criteria:	The product should address all the business need and able to overcome the business problem mentioned above.
	The product should meet all the objectives mentioned above.
	The outcome of the product should meet the outcome product as listed above.
Quality Tolerances:	Quality should never be a variable and should follow the project acceptance criteria set.
Quality Method:	Requirements of system are written in user story form for better understanding of requirements of the system by the team.
Quality Responsibilities:	Business Ambassador
	Solution Testing Team

Table 31: Project product description.

Project approach

The proposed new program is based on identifying the large customer who is ready to purchase online software with the help of electronic installation entry. The online business system will be enabled through cloud with the aim of being thoroughly checked. Legal approval is required deploying the application and for developing various policies for using the application. Using remote web application, the item index will be transferred and updated. The developers will be available whenever necessary so there will be low chances of miscommunication with the team. The team will have a good understanding of the project's criteria and business need to build this project in-house.

The conceptual framework is to be developed using an Agile Methodology (DSDM). Using DSDM, there will be a high level of client engagement which will make it less difficult to understand the requirements. Moreover, there can be proper coordination between team and client in this methodology. DSDM allows essential products to be

manufactured first, with a primary focus on consistency and business needs. For DSDM the time-to-market will be small as the project incrementally grows in timebox and upgrades for new features. DSDM can help maintain production schedule and project budget when responding to rising business needs. This approach involves a lot of preparation and coordination with stakeholders so DSDM is chosen for development of project.
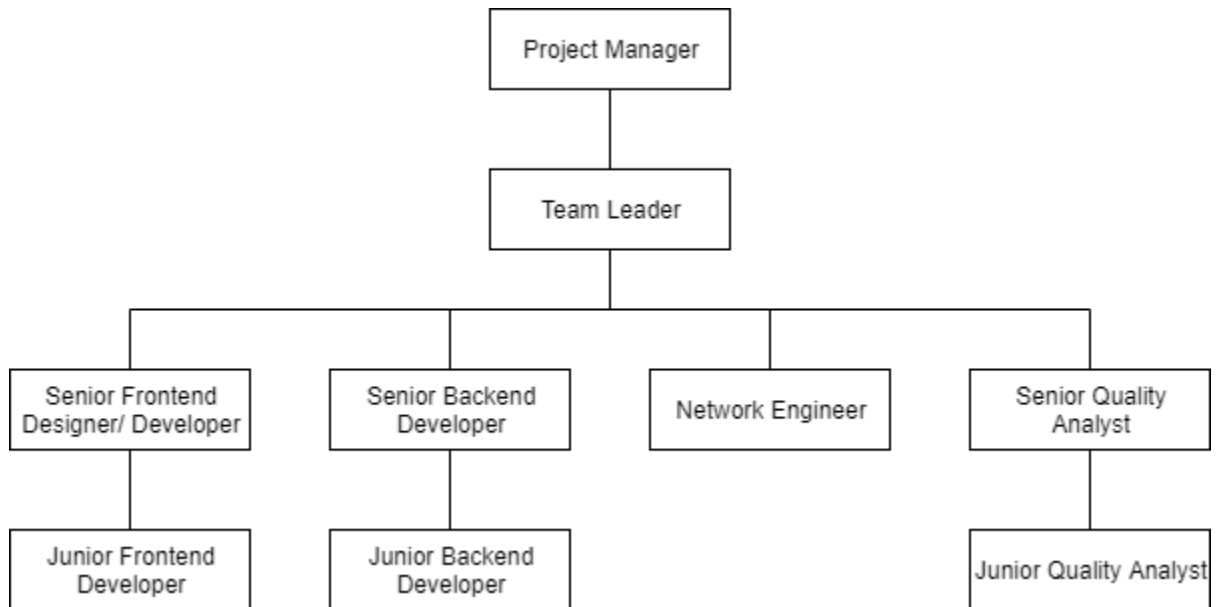
Project management team structure

Figure 9: Team structure of team who are responsible for development activities.

Roles descriptions

Project Manager

Project Manager obtains requirements for the project and is responsible to allocate task for the project and develop timebox for the project. Likewise, project manager is also responsible for contacting with upper level management.

Team Leader

Team Leader is responsible for coordinating with Project Manager and is responsible for managing the issues which occurs in solution development team.

Senior Frontend Designer/Developer

Senior Frontend Designer/Developer is responsible for designing the product in order make the application visually appealing for the users. Frontend Designer/Developer is also responsible for carrying out development activities regarding frontend of the application. Senior Frontend Designer/Developer also allocates and reviews task of Junior Frontend Developer regarding frontend development.

Junior Frontend Developer

Junior Frontend Developer carries out task as allocated by Senior Frontend Developer.

Senior Backend Developer

Senior Backend Developer is responsible for designing overall system architecture. Senior Backend Developer develops the backend of the application and allocates and reviews tasks of Junior Backend Developer for system development.

Junior Backend Developer

Junior Backend Developer carries out task as allocated by Senior Backend Developer.

Network Engineer

Network Engineer is responsible for maintaining servers of the application. Network Engineer also design network architecture for the product in order to maintain backup of data and manage request of multiple users.

Senior Quality Analyst

Senior Quality Analyst create test plans for the application so that client can obtain optimum satisfaction while using the product. Senior Quality Analyst ensures the quality of the developed product. Senior Quality Analyst also allocates and reviews of task Junior Quality Analyst for system development.

Junior Quality Analyst

Junior Quality Analyst carries out task as allocated by Senior Quality Analyst.

PRINCE2 and DSDM

PRINCE2

PRINCE2 (an acronym for PRojects IN Controlled Environments) is a de facto process-based method for effective project management. It is used extensively by the UK Government, PRINCE2 is also widely recognised and used in the private sector, both in the UK and internationally. The PRINCE2 method is in the public domain and offers non-proprietorial best practice guidance on project management. (PRINCE2, 2020)

PRINCE2 explores breaking down a large project into smaller components to ensure progress is managed. Hence, this provides project manager time to reflect on whether anything which they are doing is causing an over run on site. A key point of PRINCE2 projects is for this continual learning. It's key for companies are monitoring, reporting and analysing organizations how projects were performed and whether they were successful. (MacIntyre, 2018)

Four Integrated elements of PRINCE2

Four integrated elements of PRINCE2 are as follows:

1. Principles
2. Themes
3. Process
4. Project environment

Figure 10: PRINCE2 and it's elements. (MacIntyre, 2018)

The above diagram illustrates the elements that are present in PRINCE2.

Key features of PRINCE2

The key features of PRINCE2 are as follows:

- Focus on business justification
- Defined organisation structure for the project management team
- Product-based planning approach
- Emphasis on dividing the project into manageable and controllable stages
- Flexibility that can be applied at a level appropriate to the project. (PRINCE2, 2020)

Seven Principles of PRINCE2

Figure 11: Seven Principles of PRINCE2. (KnowledgeTree Training, 2015)

The above figures illustrate seven principles of PRINCE2. Below principles of PRINCE2 has been explained in detail.

Continued Business Justification

First of all motives and goals of the project have to be explained before beginning the actual construction of the project. The managers team also ensures that these considerations remain valid throughout the entire development phase of PRINCE2 ventures (KnowledgeTree Training, 2015).

Learn From Experience

According to this principle, managers should learn from their previous experience and apply this experience in the current project. Project Manager are also expected to learn from others to manage their projects better. All these lessons learned from past and current projects are documented in a log of the lessons. (KnowledgeTree Training, 2015)

Defined Roles and Responsibility

According to this principle, in PRINCE2 projects, all roles and responsibilities are defined and assigned to the teams and individuals working on the project according to this principle. (KnowledgeTree Training, 2015)

Manage by Stages

The development of the project is divided into small stages, which are monitored and controlled separately for efficient management. Upon completion of each stage the project is evaluated to ensure that it is established in compliance with the specifications and expectations of the client. (KnowledgeTree Training, 2015)

Manage by Exception

All tolerances for time, expenditure, price, and scope are set in this PRINCE2 concept. Delegated authorities are restricted, and accountabilities are specified. In the event that these tolerances exceed or there is a risk of exceeding them, next management stage will be told for further proceedings. (KnowledgeTree Training, 2015)

Focus on Product

This principle focuses on achieving the requirements of the project satisfying the client as specified in the requirement document. This concept is based on product planning and product definition. (KnowledgeTree Training, 2015)

Tailored to Suit The Project Management

According to this principle, PRINCE2 management should be tailored by keeping size, risk, environment, importance, capabilities, and some other factors in mind. (KnowledgeTree Training, 2015)

DSDM

DSDM is an agile method that addresses the needs of both simple product development where teams are likely to be co-located, and more complex project situations, which may involve several teams that may be distributed and may even be in different countries and time zones. Roles and responsibilities in DSDM, nine principles of DSDM and Phases of DSDM has been explained in Chapter 2. (agilekrc, 2020)

Critical Comparison between DSDM and PRINCE2

DSDM and PRINCE2 have accreditation and examination processes. Both have accredited training organization that can prepare delegates for these organizations. In terms of applicability of DSDM and PRINCE2, both methodologies can be used for IT as well as non-IT projects. PRINCE2 and DSDM2 apply to projects which can exist in their own right or have relationships with other projects or are part of larger programmes of work. Moreover, both PRINCE2 and DSDM are applicable to all sizes and types of organizations and projects. Both DSDM and PRINCE2 are product based and business focused. (Tudor, 2006)
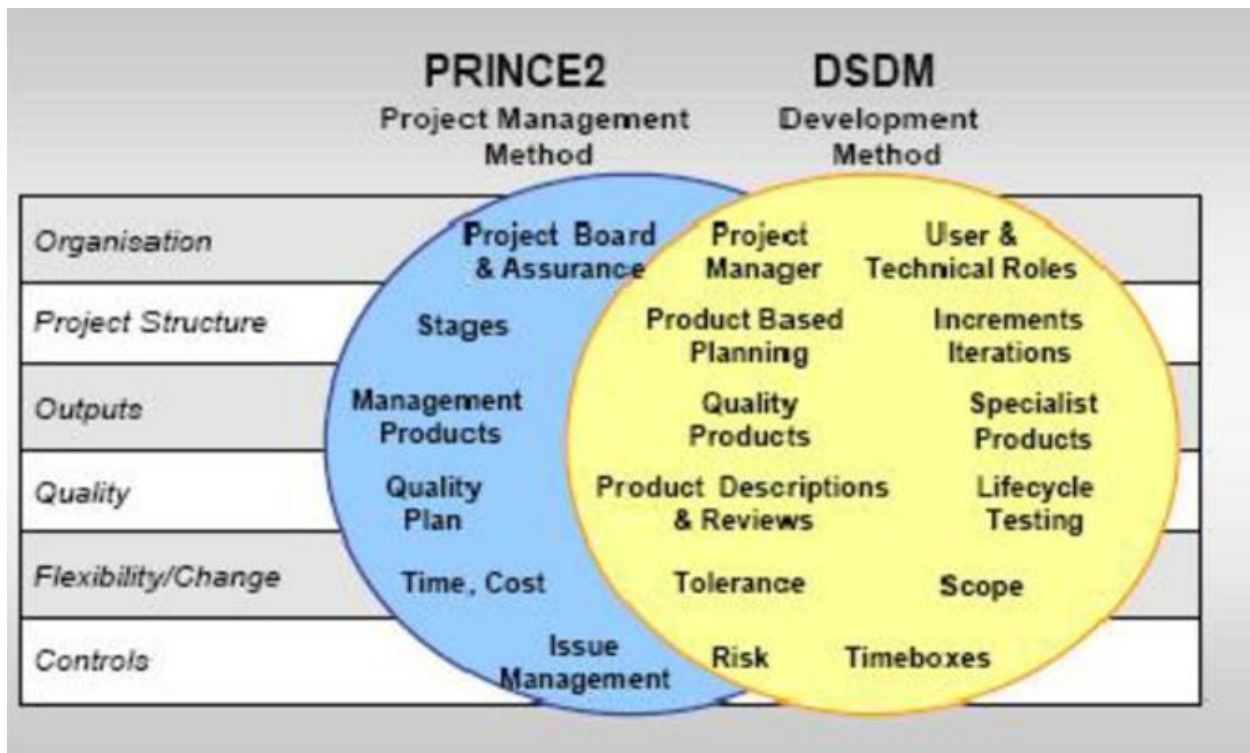

Figure 12: DSDM and PRINCE2 Integration.

The above diagrams represent the integration in between PRINCE2 and DSDM.

Altruistic Inc is a large multinational company. Altru Drive is the extend to the core product line for the Email management system of Altruictic Inc. The product comprises of large program of works. Also, Altru Drive is a product-based project and business focused as it should support 100,000 users at a time. Therefore, PRINCE2 and DSDM is applicable for the project of Altru Drive.

Critical differences and synergies between DSDM and PRINCE2

Aspects	DSDM	PRINCE2
Teams and communication	DSDM promotes the use of small teams that are self-organized. For more effective work, it has guidelines on organized workshops and rich communication.	PRINCE2 has strong guidance on the hand-over of work to teams but treats the team-level of working as being out of scope for its guidance.
Flexibility, Prioritisation, Tolerance	DSDM has a philosophy of design versatility, deliberate prioritization and the understanding that the project must de-scope features of lower priority to deliver on time and within budget. DSDM does not advocate time and cost tolerance at all.	PRINCE2 allows tolerance on time, cost, scope, benefit, quality, risk.
Discovery vs. Detailed Product Descriptions	DSDM discourages the initial production of a comprehensive design specification and encourages an incremental approach to finding the precise specifications during the project.	PRINCE2 describes at the beginning the product breakdown structure and product descriptions, with further information at the limits of the phases. Product descriptions are a powerful tool, if held at a high level and supported by expected exploration of the more specific criteria by user participation

		within the team during the execution of work packages.
Incremental Delivery	DSDM aims to deliver the product incrementally throughout the project. The project is "chunked" inside short timeboxes into small deliverables, handled by small teams.	PRINCE2 does not give specific guidance on the management of teams, but the ethos of many traditionally-run projects is more of the production line than the craft teams.

Table 32: Critical differences and synergies between DSDM and PRINCE2. (Tudor, 2006)

Perceived Limitations of PRINCE2 which can be improved by DSDM

PRINCE2 can be perceived as:	DSDM would improve this by:
Heavily document-driven and bureaucratic.	Introducing small teams, short timeboxes and more facilitated workshops and face-to-face communication.
Waterfall (one delivery at the end of a potentially long project).	Incremental development and delivery of product throughout the project. This fits well with the Work Packages and Product Based Planning technique of PRINCE2.
Non-Agile (unable to easily and quickly manage change and uncertainty).	Including empowered, responsible user representatives within the teams to handle detailed definition of product. Up-front definition is high-level, with prioritisation providing the mechanism to handle inaccurate estimates.
Not making on-time and on-cost delivery a strong enough probability.	Removing time and cost tolerance and replacing this with a culture of flexibility of requirement.
Not covering enough techniques.	Providing DSDM techniques and guidance for: rich communication; team working; project planning; timeboxing; prioritisation.

Table 33: Perceived Limitations of PRINCE2 which can be improved by DSDM. (Tudor, 2006)

Perceived Limitations of DSDM which can be improved by PRINCE2

DSDM can be perceived as:	PRINCE2 would improve this by:
Agile, and therefore not sufficiently strong on governance for large organisations and large projects.	Overlaying the structure of the Project Board and Project Assurance.
Iterative, and therefore potentially not sufficiently controlled.	Using the methodology of product-based planning to describe the high-level products to be delivered in each timebox. Retention of the timebox exception procedure which has not been implemented successfully.
Not defining the products in detail at the outset, and therefore having an ill-defined outcome.	Using Product Based Planning technique to define the high-level products to be delivered.
Advocating face-to face communication and therefore not having a sufficient audit trail.	Retaining emphasizes light level coverage. Use Configuration Management and Quality Review (both also present in DSDM) for products with completed timebox.

Table 34: Perceived Limitations of DSDM which can be improved by PRINCE2. (Tudor, 2006)

Integration of DSDM and PRINCE2 at process level

S.N.	PRINCE2 Processes	DSDM processes
1.	Directing a Project Directing a project runs from project initiation until it is completed. This method addresses the Board of Projects. The Project Board manages and tracks through a variety of decision points through reports and controls. The key processes for the Project Board break into four main areas: • Initiation (starting the project off on the right foot) • Stage boundaries (commitment of more resources after checking results so far) • Ad hoc direction (monitoring progress, providing advice and guidance, reacting to exception situations) • Project closure (confirming the project outcome and controlled close). • This process does not cover the day-to-day activities of the Project Manager.	
2.	Starting up a project This is the very first PRINCE2 operation. It is a pre-project phase, designed to ensure that the pre-	The first step of DSDM is called phase PreProject. The main aspect of this process is to ensure that there is a clear objective of what project wants

	requirements for project initiation are in place. The mechanism requires a Project Mandate to exist which specifies the purpose for the project and what result is sought in high-level terms. It should be very short to start a project. The process work is based around the three elements being produced: • Ensuring that the information required for the project team is available • Designing and appointing the Project Management Team • Creating the Initiation Stage Plan.	to achieve and that the project has a clear vision. In this step, the product produced is assumed to have a competitive value for the company. Business visionary and business sponsors are listed, and a Reference Term is created. At this stage the activities involved are: • Identifying project roles and scope. • The Feasibility Phase Program. This stage is close to the Starting a PRINCE2 project cycle for our project. Both steps include related activities that involve defining business case and project start feasibility. If the business case is feasible and creates value for the company, preparation for the next stage is reported. In these processes the project team is also named.
3.	**Initiating a Project** Initiating a Project is carried out by the project manager, whose firm project structure is formed to ensure that the team recognizes the work to be done and is committed to the project. The objectives of Initiating a Project are:	Feasibility and Foundation process in DSDM addresses the tasks of PRINCE2 Initiating Phase. The advantages are identified from the proposed solution in the feasibility process, and the expense and time required for project completion is identified. The outline plan shall be prepared which shall include the

	- To agree on whether or not there is sufficient justification for proceeding with the project - Establish a stable management basis on which to proceed - Document and to confirm that there is an acceptable business case for the project - Ensure that a firm and accepted - Foundation undertakes the project before starting the work - Agreement on the commitment of resources for firms - Allow and enable the Project Board to take control of the project - Provide the basis for the decision-making processes needed during the lifetime of the project - Ensure that the time and effort necessary for the project is spent wisely, taking into account the risks to the project	estimates of benefits, costs and time. In the foundation process a priority list of requirements is created. In this step, a foundation document on market, solution and management is produced which explains the roles of people, team structure, communication approach and project approach
4.	Managing Stage Boundaries The method is carried out at the end of each stage by the project manager, except for the final stage. The process offers key decision points for the Project	In DSDM a retrospective conducted after each timebox where the team analyzes the output of the timebox. A plan for development of the next timebox is developed based on these retrospectives. Task preparation for

	Board on whether or not to proceed with the project. The aims of the process are to: - Ensure that all deliverables identified in the current Stage Plan have been completed as specified - Provide the information necessary for the Project Board to determine the project's continuing viability - Provide the Project Board with the information necessary to approve the completion of the current stage and allow the initiation of the next stage, along with its assigned tolerance level - Report any observations or lessons that may aid in the later stages of this project and/or other projects.	the next timebox is performed at the start of the timebox
5.	Controlling a Stage The method outlines the Project Manager's monitoring and control tasks involved in ensuring a stage stays on track and responds to unforeseen events. The method forms the core of the project manager's focus on the project, which is the mechanism that manages the day-to-day project management.	The risk reports, problem and change request logs are recorded in DSDM in the live document generated in the Foundation process known as the Delivery Control Pack which is communicated to the team members at the project level. The work is done in timeboxes in DSDM, so the authorisation and assignment work is done in the evolutionary

	A cycle consisting of: • Authorizing work to be done Collecting progress information on that work • Watching for changes • Reviewing the situation • Reporting • Taking any necessary corrective action will take place throughout a stage.	development's timebox planning stage. The planning of the timebox is done before each timebox and the team is assigned the work. The timebox progress is monitored and reported to the project manager.
6.	Managing Product Delivery Managing Product Delivery is carried out by the team and the team manager. The process offers key decision points for the Project Board on whether or not to proceed with the project. The goals of the process are to: • Ensure that the Project Board has completed all the deliverables planned in the current Stage Plan as defined. • Provide the information the project board needs to assess the project's continued viability. • Provide the Project Board with information necessary to approve the completion of the current stage and allow the start	In DSDM this process is similar to timebox execution and completion of the assigned work in the timebox. The development team carries out the work after timebox planning. Technically the research is tested, and company acceptance testing is also carried out. After the work is tested and reviewed, it is sent out for deployment. During the delivery process the work is put into service. The process is repeated in each timebox, and the project manager will be provided with the progress update.

	of the next stage along with the level of tolerance assigned to it. • Record any measurements or lessons that may assist in later stages of this and/or other projects.	
7.	Closing a Project This method has the function of performing a guided close to the project. The method includes the job of the Project Manager to complete the project either at the end of the project or at premature completion. Most of the work is to prepare input to the Project Board in order to get its confirmation that the project can be completed. Therefore, the aims of closing a project are to: • Review to what degree the goals or priorities set out in the Project Initiation Document (PID) were achieved. • Confirm the extent to which the Project Initiation Document (PID) is fulfilled, and the satisfaction of the Customer with the results. • Obtain formal acceptance of the proceeds. • Ensure to what extent the Customer has delivered and accepted all expected products.	Under DSDM, the project is closed once the last timebox is done. After the last timebox, there will be a review where the team can evaluate overall timebox success and prepare the lesson learned study. Members of the project level confirm the project has been closed. The business visionary prepares the benefit evaluation report post-project.

	- Confirm that there are maintenance and operational plans in place (if applicable). - Make any follow-on recommendations. - Capture lessons from the project and complete the Report on Learned Learnings. - Prepare a Report of the End Project. - Notify the host organization of the intention to disband organization and resources of the project.	

Table 35: Integration of DSDM and PRINCE2 at process level.

Integration of DSDM and PRINCE2 as per the roles

PRINCE2 as well as DSDM delegate roles and responsibilities within the project management team. Assigning concise role help to smooth project activity. We'll be comparing the different roles of PRINCE2 and DSDM in the table below.

S.N.	PRINCE2 (Roles and Responsibilities)	DSDM (Roles and Responsibilities)
1.	Project Board PRINCE2 requires the appointment of a Project Board to provide general direction and project management. The Project Board consists of three roles: • Executive • Senior User • Senior Supplier	DSDM does not specifically require the Project Board but it sits comfortably within the context of the DSDM project.
2.	Executive Executive is the chair of the project board. This position is responsible for continued sustainability and ensuring that the project is value-for-money and meets market demand.	Executive Sponsor The PRINCE2 Executive maps directly to the DSDM Executive Sponsor and is ultimately responsible to corporate and/or program management for the project.
3.	Senior User The PRINCE2 Senior User is responsible for committing user resource to the project. PRINCE2 indicates that this position may require more than one person to cover all user interests but warns that splitting the role may diminish its effectiveness.	Visionary The PRINCE2 Senior User corresponds closely with the DSDM Visionary. DSDM warns the lack of a clearly defined group of users poses a risk for the project.
4.	Senior Supplier The Senior Supplier represents the interests of those involved in building and	Senior Supplier is a PRINCE2 role and is not present in DSDM.

	deploying the products of the project. Senior Supplier is responsible for the quality and timely delivery of the products and for their suitability for business purposes	
5.	Project Manager (PM) In both PRINCE2 and DSDM, the Project Manager is responsible for delivering the agreed products efficiently, to the agreed quality standard, on schedule and within budget, and is capable of delivering the benefits set out in the PID. PRINCE2 focuses on the traditional Project Manager responsibilities.	Project Manager (PM) The role of Project Manager is similar to role of PM as stated in PRINCE2. Moreover, DSDM adds a complementary emphasis on: • Empowering the project team • Protecting the project team from outside interference • Ensuring that the team can remain stable and focused throughout the project • Managing user involvement in the project and ensuring users continue to be available when needed.
6.	Team Manager In the context of larger projects, PRINCE2 describes this function, where teams with different skills and knowledge are needed or where a third party is doing research.	Team Manager For a smaller project that uses PRINCE2 and DSDM, the role of Team Manager corresponds directly to the position of DSDM Team Leader. This individual is responsible on ensuring that the development team is delivering the appropriate program to achieve its objectives.

7.	Project Support An organization that set up a Project Support Office to provide administrative support to the project manager, either because of the workload or to assist in the use of specific tools in the project.	Project Support Project Support could include providing the scribe and facilitator roles which DSDM projects require.
8.	Project Assurance PRINCE2 assigns project monitoring roles to the members of the Project Board, and each member fulfils that task from its own perspective. The Project Board can delegate the responsibility for project assurance to an independent project assurance team.	Project Assurance The Project Assurance Group may be redundant in DSDM projects due to the company and users ' much closer relationships and participation, and the increased visibility provided by regular deliverables. Many DSDM initiatives are undertaken at a fixed budget and decisions are always based on the business gain.

Table 36: Integration of DSDM and PRINCE2 as per the roles. (DSDM Consortium, 2000)
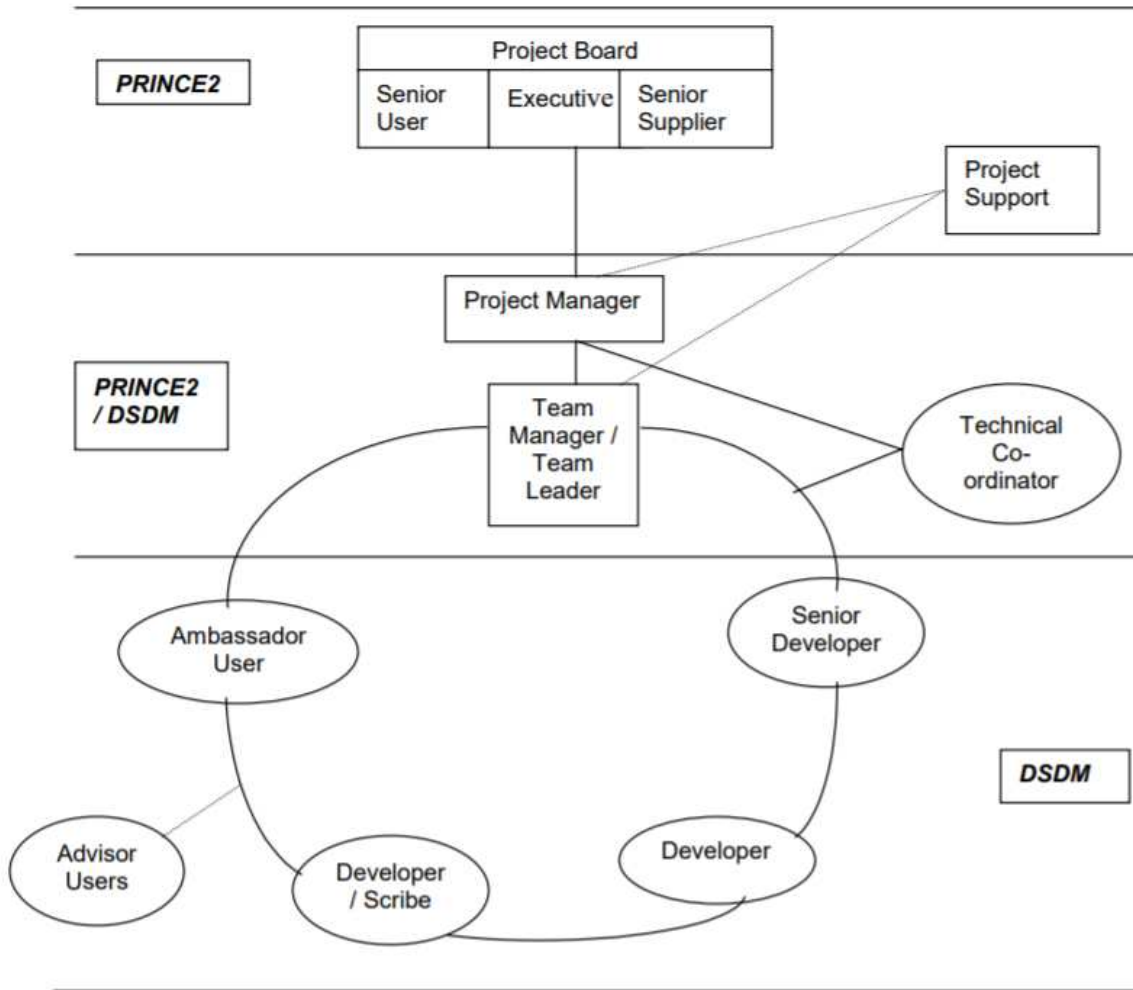
Figure 13: PRINCE2 and DSDM Combined Project Structure. (DSDM Consortium, 2000)

The above figure represents combined project structure of PRINCE2 and DSDM.

Outline Method for using PRINCE2 and DSDM together to deliver more successful projects

- Using PRINCE2's Model, Components and Techniques, but with a DSDM culture (light documentation, mixed user and developer teams, regular tests, frequent, deliverables, rich communication);
- Use the PRINCE2 Management Products as required, but with a DSDM culture;
- Use the Roles of the PRINCE2 Project Board with additional DSDM guidance;
- Using Project Assurance, but with a light touch, to encourage self-organizing and empowered teams;
- Use the role of DSDM project manager, with PRINCE2 role description guidance;
- Use the functions of the DSDM team for those focused on product development, procurement and deployment;
- Use the DSDM lifecycle and goods explicitly to improve the method of handling product delivery and ensure prototyping approach to research, design and construction. Apply the incremental implementation approach of DSDM;
- Use DSDM guidance for facilitated workshops and team behaviours;
- Teach the DSDM culture and techniques to PRINCE2 project management teams, at all levels (Tudor, 2006)

Results of using DSDM in a PRINCE2 project

- Short timeboxes within stages;

- Small teams with empowered user representatives as fully-resourced and continuous team members;

- Delivery of business products during the project, not just at the end;

- Fewer change requests (most are dealt with at team level, in line with initial prioritisation agreed by major stakeholders);

- Fewer exception situations (flexibility to de-scope to stay within plan is in the hands of the team, but controlled by the baselined high level prioritised requirements, signed-off by the Senior User/Project Board);

- More visibility of progress (complete and business-meaningful products delivered during the project are visible measures of progress);

- Timeboxing to keep the project on track. This simplifies the use of tolerance. The only tolerance used extensively is scope, and this is flexed under the control of the empowered business representatives. This gives the business what they often need the most – on time and on budget delivery of a product which meets the business objective;

- Prioritisation being clearly defined, and performed early in the project;

- Facilitated workshops and face-to-face communication, minimising documentation wherever possible;

- Team roles, including user and developer responsibilities, being clearly defined, but teams being self-organising;

- An iterative and incremental approach to development and delivery of the final product, enabling the culture-change from a traditional "waterfall" and one delivery approach. (Tudor, 2006)

Results of using PRINCE2 in a DSDM project

- Corporate management confidence in the control and governance of projects;

- A Project Board with clear responsibilities;

- Project Assurance of the on-going progress;

- A clearly-defined set of management products, to be tailored as required;

- A clearly-defined escalation (exception) process, when needed;

- A well-documented approach to Product-Based Planning and Quality Review. (Tudor, 2006)

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