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Platform: Data framework	**Project: 001**	

Title:

PID - Project Initiation Document

Summary: Company Secret

The PID serves as a baseline for project introduction. The deliverables expected as a result of the bachelor thesis project (BTP) are laid out here. The long term organizational goals are also presented.

For change control	Reviewers	For info
Kanishk Mishra, Co-founder and CEO, DFPL	Gourinath Banda, Mentor, IIT Indore Pankhuri Jain, COO, DFPL	Raghav Mahajan, intern, IIT Indore

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OPEN ISSUES

ID	Description	Action holder
1 and 2	Review sections 1 and 2	Gourinath, Pankhuri
3.3	Boundary conditions	Kanishk
3.4	Acceptance criteria	Kanishk
3.5	Initial estimates, milestones and risks	Kanishk

DOCUMENT CHANGE & HISTORY RECORD

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APPLICABLE DOCUMENTS

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Reference documents

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[3.2]				
[3.3]				

RELATED PROJECTS

Project Name	Description	Relation

ABBREVIATIONS

Abbreviation	Description
DFPL	Dataculture Farms Private Limited
BTP	Bachelor Thesis Presentation
IIT	Indian Institute of Technology
HW	Hardware
SW	Software
UAV	Unmanned Aerial Vehicle
TU	Technical University

DEFINITIONS

Definition	Description

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1 PROJECT IDENTIFICATION

1.1 PROJECT DESCRIPTION

The first project as laid out in the title Project 001 is the student internship project by Raghav Mahajan, currently enrolled in the final year of IIT Indore. The main deliverable of this project consists of developing a framework for capturing field data from the farm and uploading the same to the cloud. The project will serve as a guidline for future development work for the company towards developing an IoT suite for precision farming. In addition to the project deliverable, the project definition should meet the academic prerequisites to fulfil the BTP requirements. The triple constraints for the project are given below:

1. Scope – BTP report, tangible product (sense farm data, post on the cloud and a simple dashboard for analysis)
2. Schedule – 1st August 2019 to 15th December 2019 – 40-50 hours per week [19 weeks and average 900 hours]
3. Cost – Internship stipend payment of ₹ 15,000 per month plus the cost of hardware needed for the project

1.2 PROBLEM STATEMENT

Agriculture is one of the least digitized industry. In India, it is widely practiced based on traditional practices. The per unit yield from farms in Western European countries is amongst the highest in the world. The long term goal for DFPL is to develop integrated (HW and SW) solutions to improve agricultural yield for Indian farmers.

In addition towards addressing the yield problem, the focus also lies on developing methodologies for maximizing water utilization for irrigation in an effective manner. Currently, more than 600 million Indians suffer from severe water scarcity. The ground water consumed by India is more than that of USA and China combined. We at DFPL strive to use technology for enabling Indian farmers for deploying low cost irrigation solutions tailor made for the respective farm conditions.

Project 001 is intended to create a systematic and structured data collection methodology for sensing farm parameters for providing data based intelligence. The farm inputs needed in the initial stage are generating a field map and allocating coordinates to the field, soil scan, and UAV sensing (temperature and cholorophyll content).

1.3 PROJECT OBJECTIVES

The key objective of project 001 is to deliver a solution that can generate field maps, sense and store soil scans on the server (or cloud) and create a framework (system architecture) for future work. The end result of this work is a tangible and a low cost IoT (real-time) based farm sensing suite, designed with the possibility for future scalablity.

1.4 MAJOR DELIVERABLES

The major deliverables in order for succesfull project completion are listed below:

Table 1.1   Major deliverables

Reference Number	Major Deliverables
D1	Identification of the HW needed
D2	SW development
D3	System integration and testing
D4	Basic dashboard for data analysis

1.5 CRITICAL ROLES & RESOURCES FOR INITIATION

The roles and responsibilities are shown in the Table below:

Table 1.2   Responsibilities

Critical Role	Who?	Responsibilities	Estimated Request (FTE)
Funding, technical, and other	Kanishk	Ensuring availability of all the resources needed for the success of the project.	1.0
Technical mentor	Gourinath	Guide Raghav and provide technical assistance and supervision	0.5
Co-ordinator	Pankhuri	Co-ordinating all the operations in India	0.2
Execution	Raghav	Plan, develop and execute the project to meet the milestones and provide various deliverables	1.0

1.6 PROJECT CLASSIFICATION

The purpose of the project classification below is to determine the right governance to be applied to the project.

Table 1.3   Project classification

NON PGP CLASSIFICATION TABLE					
Team Size	**Project Length**	**Risk**	**Total project cost**	**Project Type***	**Classification score:**
[5] >50	[5] > 1.5 years	[5] Many high risks	[5] ≥ 1.5M	[5] Breakthrough	
[4] 26 to 50	[4] 1 to 1.5 years	[4] Some high risks	[4] ≥ 1M to < 1.5m	[4] Innovative	
[3] 11 to 25	[3] 6 to 12 months	[3] Few high risks	[3] ≥ 500K to < 1M	[3] Strategic	
[2] 6 to 10	[2] 4 to 6 months	[2] Moderate risks	[2] < 500K	[2] Operational	*1 + 2 + 5 + 1 + 4 = 13*
[1] 3 to 5	[1] 2 to 4 months	[1] Low risks	[1] < 250K	[1] Supporting	
[0] 1 to 2	[0] < 2 months	[0] Very low risks	[0] Not Available		

COMPLEXITY INTERPRETATION	
Classification Score (From above)	**Complexity**
[18 – 25]	Extended
[10 – 17]	Complex
[0 – 9]	Basic

* Project Type Legend:

Breakthrough Project – An effort that will use or advance new technology, technical concepts or new ways of working that have not been attempted before in industry or in a particular manufacturing or product development process.

Innovative Project – An effort that will introduce new ideas, concepts or solutions using current technology or technical concepts (or ways of working and related concepts in use in other industries/companies)

Strategic Project – An effort that will achieve a specific or general strategic business objective.

Operational Project – An effort that is characterized by a reused or repeatable approach to work that is applied by an individual or team that is familiar with the nature of the work performed.

Supporting Project – An effort that uses established technical competencies in achieving an objective or producing a deliverable that is required or otherwise used by an individual organization or sector with very low risk, short duration, few people and no cross-sector impacts.

1.7 LESSONS LEARNED OF PREVIOUS PROJECTS

Not applicable

End of Identifying phase.

2 PROJECT ORGANIZATION & STAKEHOLDERS

2.1 CORE PROJECT TEAM

Table 2.1   Core project team

Name	Role	Responsible for Deliverables
Kanishk	Project Leader	Final project completion
Gourinath	Mentor	Technical guidance and supervision
Pankhuri	Coordinator	Operations and communications
Raghav	Intern	Development, execution and final delivery

2.2 INITIAL STAKEHOLDER LIST

Various stakeholders involved in the project are listed below:

Table 2.2   Stakeholder list

Name Stakeholder	Role	Interest in Project
DFPL	Parent organization	Project deliverables
IIT Indore	Technology partner	Research
Raghav Mahajan	Intern	BTP completion and hands-on work experience
Van den borne aardappelen	Technology partner	Knowledge transfer
TU Eindhoven	Knowledge partner	Research

2.2.1 DEPENDENCIES / INTERFACES WITH OTHER PROJECTS

Not applicable

2.3 HIGH-LEVEL COMMUNICATION STRUCTURE

The project progress needs to be monitored by having weekly progress and review meetings. The end of the month meetings will also be scheduled to track the various product deliverables.

Table 2.3   Communication structure

Name	Participants	Purpose	Frequency	Remarks
Weekly	Raghav, Kanishk, and Gourinath	Progress and review	Once a week	
Monthly	All	Milestones and deliverable status update	Once a month	
Final hand-over	All	Project hand-over	15th December 2019	To be finalized

2.4 GOVERNANCE BODIES

Table 2.4   Governance

Board or Committee	Member Names	Meeting Frequency
Steering Committee	Kanishk, Gourinath, Pankhuri	Monthly
Project Board	Kanishk, Pankhuri	Weekly

2.5 PROJECT MANAGEMENT APPROACH

Due to the complexity and global nature of the project an agile approach will be used. The agile process seeks to respond to the project uncertainties through incremental, iterative work cadences and empirical feedback.

3 PROJECT DEFINITION

3.1 FLEXIBILITY MATRIX

The flexibility matrix for project 001 is shown below:

Table 3.1   Flexibility matrix

	Least Flexible	**Moderately Flexible**	**Most Flexible**	**Explanation**
Scope (incl. quality)			✔	Broad deliverables
Time	✔			Very limited (only 5 months)
Resources (manpower & budget)		✔		Currently bootstrapped

3.2 PROJECT SCOPE

The HW identification, system (HW and SW) development, testing and integration is part of the Project 001. Considering the project timeline, a fully scalable and functional solution is out of scope. The data anlystics and output intelligence is also out of scope of this project. The workflow for Project 001 is shown below:
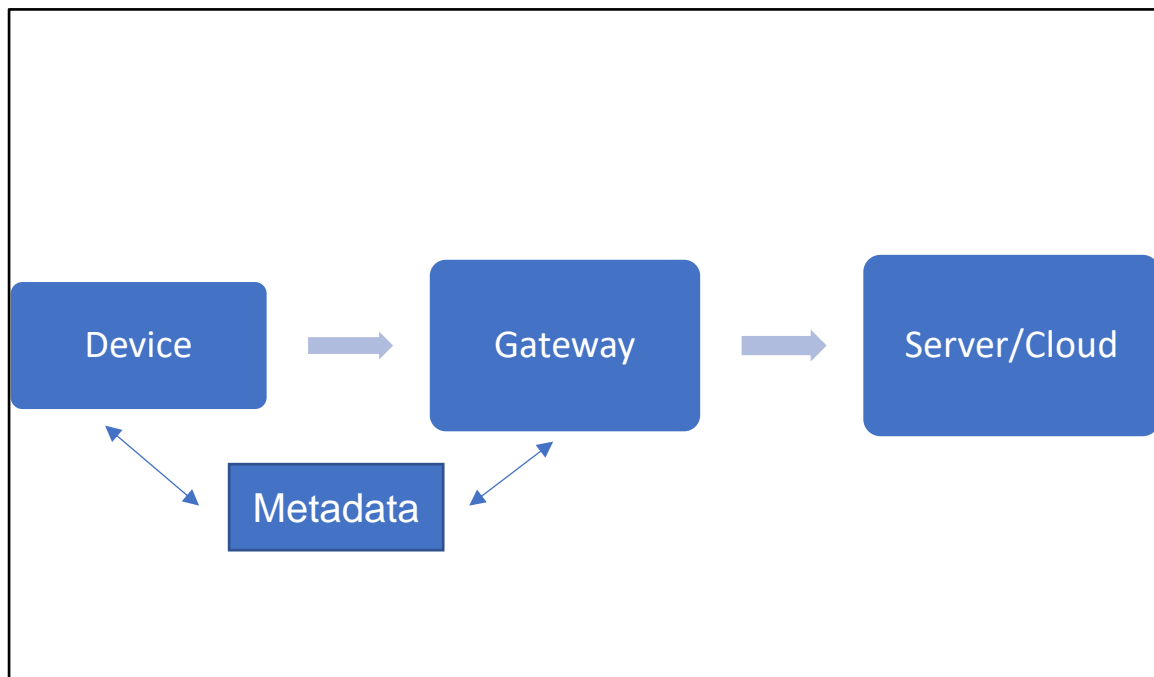
Device – A device includes HW and SW that directly interacts with the farm (soil in this case). Devices also communicate with each other via a network.
Gateway – A gateway that enables devices to reach the cloud or the server. Gateway can also be the class of devices that process data before uploading the same to the cloud.
Server/Cloud – A central data repository for storing the sensed data. The data is processed and combined here with data from other devices.
Metadata – Metadata contains information about the device, and is generally immutable. It can include records like device id, class or type, time stap, GPS co-ordinates etc.

The requirements for Project 001 are listed below:

1. Req1 – To develop an array of devices (integrated sensor) to sense the soil moisture for a 1 Ha field.
2. Req2 – Record the metadata along with the sensed data (time, location, and device ID)
3. Req3 – Develop an information gateway for assembling and processing the signals from the devices
4. Req4 – Upload the to the server/cloud

The integrated data needed for precision agriculture can reach to around 40 layers per crop. The HW and the SW decisions taken during Project 001 will impact the inclusion of future functionalities in the system.The functionalities needed to be sensed by the device (in the near future) are [this is flexible at this moment and subject to change]:

1. Fn1 – Soil moisture or volumetric water content in soil
2. Fn2 – Soil temperature
3. Fn3 – Soil electrical conductivity
4. Fn4 – Crop growth
5. Fn4 – Crop health

The end goal for Project 001 is thus stated as:

To be able to sense the moisture content in soil from a farm sized 1 Ha, process via a gateway and upload the same to the server.

Farm location – Bhamori village near Indore.

The project scope is defined in the table below:

Table 3.2   Project scope

SCOPE OF THE PROJECT	
In Scope	**Out of Scope**
HW identification for the project	Software architecture on the server/cloud
SW needed for sensing and storing the data	Analytics deployment on the cloud
Documentation and report	Data based intelligence
Dashboard for project analysis	

3.3 BOUNDARY CONDITIONS

The boundary conditions for Project 001 are defined below:

Table 3.3   Boundary conditions

BOUNDARY CONDITIONS			
ID Number	**Pre-requisite**	**Validation Owner**	**Status (Confirmed/Not Confirmed)**
B1	HW identification	Raghav	
B2	HW availability	Kanishk	
B3	SW development	Raghav	
B4	SW availability	Raghav	
B5	System testing and integration	Raghav	
B6	System availability	Raghav	
B7	System verification	Kanishk	
B8	Project documentation and handover	Raghav	

3.4 ACCEPTANCE/COMPLETION CRITERIA OF MAJOR DELIVERABLES

Please refer the deliverables mentioned in Table 1.1 for analyzing the acceptance criterias given below:

Table 3.4   Acceptance criteria

<MAJOR DELIVERABLE NR/NAME>	
IS	**IS NOT**
D1 is made available	D1 is available but functional
D2 is tested and developed	D2 needs troubleshooting and is error prone
D3 is validated and approved	D3 does not meet the requirements
D4 is developed	D4 is not delivered
ACCEPTANCE/COMPLETION CRITERIA	
The validation and verification will be handled by Gourinath and based on test reports by DFPL	
The documentation for the project shall be maintained at all the times for transparency	
The testing only needs to be carried out in real world conditions and not in lab environment	

3.5 INITIAL ESTIMATES, MILESTONES & RISKS

3.5.1 MILESTONES

Planning and project milestones needs to be reviewed and approved by Raghav and Gourinath.

Table 3.5   Milestones

Milestones			
Project Phase	**Milestone**	**Milestone date**	**Phase duration (if applicable)**
Phase1	System design		
Phase2	System development		
Phase3	System integration and testing		
Phase4	Project documentation and handover		

3.5.2 INITIAL RESOURCE ESTIMATES

The aggrements made are in accordance with the internship contract and MoU. The roles for project 001 are given below:

- Student intern – Raghav Mahajan
- Mentor – Gourinath Banda
- Project Lead – Kanishk Mishra
- Project Coordinator – Pankhuri Jain

1.0 FTE from Raghav is agreed for the duration from 1st August 2019 to 15th December 2019 with an allocation of 40 to 50 hours per week of dedicated project related work.

3.5.3 INITIAL PROJECT FINANCIALS ESTIMATE

Table 3.6   Financial estimates

Non-PGP FINANCIAL ESTIMATES	
Key Figure	**Amount (₹)**
Total Project Costs	85,000
• Business Costs (Manpower)	67,500
• Travel	10,000
• Hardware	7,500
• Other	Unknown
Total Project Savings	
• Manpower Savings	NA
• …. (other Savings)	NA
Internal Rate of Return	Unknown
Net Present Value	Unknown
Payback Period	Unknown

3.5.4 INITIAL CONTINGENCY BUDGET

Percentage of the total project costs reserved as a buffer.

Table 3.7   Contingency budget

CONTINGENCY BUDGET	
Budget	**Amount (₹)**
Contingency Budget	15,000

3.5.5 INITIAL RISK ASSESSMENT

The risks for the project needs to be defined below.

able 3.8   Risk assessment

INITIAL RISK ASSESSMENT			
Risk Event	**Risk Explanation**	**Probability**	**Impact**

End of Initiation phase.

'Ready to Plan' tollgate: Signatures needed (see APPENDIX A)

APPENDIX A   SIGNATURE SHEET : NEEDED FOR MILESTONES

Phase:	1
Review Date:	
Approval to proceed to Planning (Y/N)	
PL and mentor: Signature (If required)	

Phase:	2
Review Date:	
Approval to proceed to Planning (Y/N)	
PL and mentor: Signature (If required)	

Phase:	3
Review Date:	
Approval to proceed to Planning (Y/N)	
PL and mentor: Signature (If required)	

Phase:	4
Review Date:	
Approval to proceed to Planning (Y/N)	
PL and mentor: Signature (If required)	