



TERMS OF REFERENCE

The development of a Minimum Viable Product of the PSET CLOUD Part 2 (MVP2)

July 2022 - March 2023



1 Background

JET Education Services (JET) and the Manufacturing, Engineering and Related Services Sector Education and Training Authority (merSETA) have initiated the PSET CLOUD (Post School Education and Training Collaboration and Learning Opportunities and Utilisation of Data), a programme that seeks to develop an integrated national digital ecosystem which is interoperable, can be used for effective skills planning and provisioning, and puts information in the hands of citizens and other stakeholders so they can make informed decisions about education and training.

The purpose of the programme is to enable the government and citizens to make informed decisions related to education, training and work. The programme seeks to ensure that data sets are interoperable, well synchronised and used effectively as sources of information for planning and improving efficiency in the PSET system as well as for individual decisions. In pursuit of this goal, the programme will establish a digital ecosystem that will strengthen, integrate, coordinate, improve efficiencies and solve challenges in the governance and management of the post- school education and training (PSET) system. The PSET CLOUD programme has many different workstreams including governance, partnership, advocacy, monitoring and evaluation and the development of an interactive platform which all support the achievement of the PSET CLOUD goals.

This terms of reference document pertains to the development of an interactive platform which will serve as a main point of contact between individuals, higher education institutions, employers and government, the PSET CLOUD platform.

Phase 1 of the programme has been completed and involved a situational analysis of the PSET sector, a mapping study, an international review of similar initiatives and a feasibility report. These research reports have been condensed and included in a publication titled [Unlocking the Power of Data: A review of the state of readiness of the Post-School Education and Training sector in South Africa for enhanced data interoperability](#), released in November 2020 and available on the JET website, www.jet.org.za. The international review, [Interoperable Data Ecosystems: An international review to inform a South African innovation](#) is also available to download.

Phase 2 of the programme commenced in 2020 with two focus areas:

- [Stakeholder engagement and scenario planning](#);
- Develop a business case for the PSET CLOUD platform for piloting/testing as the programme transitions into Phase 3 (report available upon request); and

Phase 3 of the programme commenced in 2021 with four focus areas:

- To develop a branding, communication and advocacy strategy as well as a website to update stakeholders on an ongoing basis as the platform is developed;
- Design a suitable governance model for the PSET CLOUD;
- Develop a minimum viable product (MVP1) and Self-Sovereign Identity (SSI) Solution for the PSET CLOUD;

- Ready merSETA as the early adopter of the PSET CLOUD.

This Terms of Reference seeks to outline outstanding development and testing work that needs to be completed by a service provider with a proven track record and significant experience working in the post school education and training space or with post school education training entities. The task will build specifically on the progress made during MVP1.

At the same time as the development of the PSET CLOUD, merSETA is undertaking a review of its systems and particularly data use. This is important as merSETA is positioned as the ‘early adopter’, or first test case of the PSET CLOUD. Therefore, there will need to be close alignment between the work undertaken within merSETA and the product(s) produced by the PSET CLOUD.

Furthermore, pilots external to the merSETA will be introduced to the MVP so it is important to ensure that functions needed to seamlessly interoperate with 3rd party systems are in place.

2 Scope of work

The service provider will continue from where MVP1 left off and complete the **development of the Minimum Viable Product (MVP2)** for the PSET CLOUD. The technology stack used by the previous service provider can be accessed [here](#). Some information on the technology stack document has been removed for security reasons, the full document will be shared with the service provider once appointment has been concluded and NDA signed. It’s mandatory that the service provider has experience working with the current technology stack in order to be able to build from it; however, if the service provider can incorporate the existing functionality and meet the timelines stipulated then they are welcome to use a framework of their choosing. It’s important to note that the development of the PSET CLOUD MVP2 is happening in parallel with the development of a self-sovereign identity (SSI) solution for the PSET CLOUD MVP and the solution is being developed on a sovereign framework. So, it would be beneficial for the service provider to have an understanding of blockchain technology and SSI in order to seamlessly work with the team responsible for developing the SSI solution.

The proposed PSET CLOUD platform has a number of key focus areas: 1) mapping and visualisations of demand-side trends; 2) opportunity matching; 3) credential recognition; and 4) the development of recommended learning pathways. The SSI project is working with some aspects of credential recognition and with the development of recommended learning pathways, and a long-term vision for the platform is also to provide solutions for the recognition of prior learning. The MVP2 service provider is expected to leverage these efforts as well as develop advanced solutions for the remaining components to create a full solution in these areas.

The MVP2 service provider should provide a prototype which leverages *ideal as well as actual* solutions - e.g., what can be achieved once interoperability of systems and integration is complete. This prototype will include elements such as direct access to trusted third-party data; the verification of credentials (see the SSI component) as well as the storage, retrieval and sharing of verified credentials; detailed trends mapping (for an example of the kinds of trends and insights we are looking to demonstrate see [the skills OVATE portal in Europe](#)); and recommended education and work

opportunities based on both user profiles and current industry trends (for example, we would ideally want to be able to inform PSET CLOUD members working in or training to be in the automotive sector that there is a trend towards demand for hybrid vehicles and recommend courses that can train them on this). If the prototype can demonstrate how the recognition of prior learning may be factored into stored credentials, that would also be beneficial (but note this aspect is not expected to appear in the current scope of the MVP2 and is a longer-term development vision). In short, the prototype should demonstrate what is possible, with those aspects which will then be built out for the *minimum viable product* clearly indicated. Due to the complexities of the political and organisational aspects of the PSET CLOUD, we do not expect the complete ideal solution to be achievable during the initial build contract period, but will continue to work towards it over time.

The MVP2 itself will work towards that prototype within the limitations of what we can currently achieve. For example, we do not currently have real-time data or direct data access, so the MVP2 will leverage the available data of partner organisations such as merSETA, which includes skills requirements data collected annually and data on learnerships, to build the supply and demand insights. Where necessary, dummy data can be used to test various functionalities (for example, opportunities matching); in this case sufficient quantities of dummy data should be used to demonstrate the system. Currently data is ingested into the system manually, this needs to be expanded. Ideally the system should have multiple ways of ingesting data into it, such as:

- 1 APIs
- 2 Bulk uploads
- 3 Web Scraping (this is currently being explored as a potential option)

A first priority is that the MVP2 must be launch-ready, with desirable functionalities that will encourage citizens, higher education institutions and employers to join and contribute their own data to the system. This contributed data must then feed back into the insights we are able to provide on the system. We are looking for a full, launchable solution which includes all aspects necessary to interact with the platform, including UX/UI.

The scope of work is as follows:

Stage 1: Inception

The service provider will be furnished with material which they are expected to become thoroughly acquainted with in order to continue with the development of the PSET CLOUD MVP2.

The following material will be provided to the service provider:

- Research outcomes from phase 1, 2 and 3
- User journey outcomes
- Specification documents
- PSET CLOUD prototype/MVP
- User and Admin manual of the prototype/MVP1

- Bitbucket repository from previous developers
- Swagger documentation

As part of the inception phase and throughout the duration of the project the service provider will be requested to join some meetings or workshops which JET-merSETA deem necessary. It's important that the service provider prepares for this and factors adequate touch points with both JET and the larger project into their budget. Short weekly meetings with the project team, sprint review meetings, periodic alignment meetings with other developers, and contributions to the broader team meetings held monthly by at least one developer and the project manager can be expected. At the conclusion of the project, close-out meetings with both JET and merSETA should be factored into the project budget.

In this phase, the service provider will be furnished with the functional specification documentation completed by the previous service provider together with the backlog (see Annexure A). The service provider is expected to understand and build on these items. The objective here is to ensure that functional requirements of the MVP are aligned with the expectations of JET-merSETA.

A review of the current functionality has taken place and resulted in a reprioritization of scope for the MVP. As a result, some new requirements are to be added to the current functional requirements document and backlog, while some items are being addressed by the SSI team. For a broad understanding of the requirements as they presently stand, see the introductory comments to this section on page 3.

Key deliverables

1. A short inception report with a detailed work plan that spells out the approach, timelines, deliverables, risks and mitigation strategies, budget and key resources.
2. A revised/agreed functional specification document which outlines the work to be completed during the contract.

Stage 2: Design

The service provider is expected to significantly improve the current design of the MVP2 both frontend (UI & UX) and backend. The service provider must produce a prototype that will be used to engage the JET-merSETA team before development of the actual MVP2 takes place. An important consideration at this stage is that feedback from the JET-merSETA team as well as end users is taken into account and revisions to the platform reflect the inputs received during sprint sessions. Under no circumstance is the service provider meant to develop features or functions without the approval of the JET-merSETA team.

The PSET CLOUD team is currently researching taxonomies best suited for the MVP2 with a terms of reference soon to be published for a service provider to expand on the research that has been concluded internally. The outcomes of the research will have a bearing on the underlying logic of the

PSET CLOUD as it will inform the taxonomies to be used within the system. The service provider will need to seamlessly incorporate these taxonomies into MVP2 and, to achieve this, close collaboration with the service provider assigned to the task of completing this work will be expected.

Key deliverable

- 1 A prototype that will demonstrate functionality and look and feel of the MVP2.

Stage 3: Develop & Test

The development of the MVP2 should be carried out in sprints with sprint reviews taking place in order to showcase progress made regarding the development of new features on the system. Tentative sprint review dates have been specified in section 7 of this document however these dates are subject to review by the service provider. Final dates are to be included in the inception report that the service provider is to produce as their 1st deliverable.

The attached backlog on the annexure is already split into sprints; however, the backlog needs to be reviewed to reflect the new requirements that will be added as per review of the MVP. Testing and development should be carried out iteratively, with a recurring feedback loop available for the JET-merSETA project team, together with relevant stakeholders/beta-testers to give feedback. The service provider must provide a test plan that will detail how and when new features will be tested.

Furthermore, the test plan must cater for feedback from the users (meaning a select group of beneficiaries of the system as well as initial 'trusted partners' within government) and show how the feedback will be factored into development of the MVP2. JET will facilitate access to these groups but review sessions and access should be coordinated by the service provider. In this development and testing cycle, the final output will be a functional MVP2 which has passed all User Acceptance Tests (UATs) and is ready for deployment.

Key deliverables

- 1 Detailed Test Plan with Test Cases per released features and functions.
- 2 An approved MVP2 ready for deployment.

Stage 4: Deploy

Locally deploy the MVP2 through a JET-merSETA designated internet service/cloud provider. Hosting of the MVP2 will be payable by the service provider. Furthermore, in the event that more stakeholders are onboarded to the PSET CLOUD, the service provider is expected to help with adding those stakeholders on to the MVP2 and to also test the MVP2 with newly-added stakeholders as well pre-existing stakeholders on the MVP2. Should there be bugs found during testing, the service provider is expected to address them in a timely manner or within a time period acceptable to the JET-merSETA team. Lastly, in preparation for the handover, the service provider must work closely with the merSETA team to make sure handover is gradual and engagement/use/outcomes are well-understood. Upon deployment the service provider should conduct relevant unit testing, integration testing and include notes in the coding in line with development best practices.

Key deliverables

1. Successful deployment of the MVP2 from a sandbox environment to a live environment.
2. Draft user manual & administrator manual

Stage 5: Handover

Handover of the documented source code, revised user manuals, access details and account details related to the development of the MVP2 must be given to the PSET CLOUD MVP2 lead. All documents must be delivered electronically in a format specified by the MVP2 lead. JET-merSETA will retain the ownership of the copyrights of all documentation delivered under the contract.

Key deliverables

- 1 Documented source code/Swagger Documentation
- 2 Final user manual & Administrator Manual
- 3 Hosting platform credentials
- 4 Administrator access to the MVP2

Stage 6: Support

The service provider is expected to orient select members from the project team (approx. four to five persons) on administering and using the system. The user manual will be available as a help file through an online application or knowledge-base, so that the users can refer to the manual as and when needed, potentially as part of the PSET CLOUD website or as part of the MVP2. Furthermore, the provider is expected to provide system support for at least six months after handing over the software. The support should be in person, telephonic and via email, as and when necessary. Support might include additional development work for improvement to the system.

Key deliverables

1. High-level Support Service Level Plan
2. Conduct orientation training for select members of the project team.

3 Self-Sovereign Identity Integration

In parallel with the development of the PSET CLOUD MVP2, the development of an SSI solution aimed at integrating seamlessly with the MVP2 is taking place. The incoming service provider is expected to work closely with the service provider responsible for the development of the SSI solution to ensure alignment without overlaps between the SSI component and the MVP2.

Key deliverable

1. Integration of the PSET CLOUD MVP2 with the SSI Component.

4 Onboarding New Stakeholders

From the success of the [DigiTrans 2022](#) conference and the strategic partnerships engagements that have been taking place, interest from external stakeholders to join the PSET CLOUD as early adopters has increased. Together with merSETA as the first early adopter, the PSET CLOUD seeks to onboard new stakeholders to expand the pool of early adopters.

Lessons learned and processes followed to Integration merSETA as the early adopter to the PSET CLOUD need to be applied when onboarding new stakeholders. For this reason an onboarding document together with lessons learnt and an [Integrations Requirements](#) document are being developed to help streamline the onboarding and Integration of stakeholders into the PSET CLOUD.

5 Important Considerations

1. Sprint grooming needs to take place with the JET-merSETA team before work on the sprints commences as there are items in the backlog that the JET-merSETA team and the service provider need to align on.
2. Sprint reviews are to take place as per agreed schedule between the service provider and JET-merSETA. Under no circumstances are sprint reviews to be missed. Missed reviews resulting in delays in the project will not be the responsibility of JET-merSETA and will be at the cost of the service provider. Delays must be recorded on a log sheet with reasons provided.
3. System architecture must be microservices and not monolithic.
4. Open source applications are preferred.
5. The less subscriptions the better.
6. Fees for any software, subscriptions or licenses will be payable by the service provider and must be communicated in writing to the MVP2 team.
7. The POPIA Act must be adhered to by ensuring that the MVP2 is hosted locally as it will hold private national data.
8. Development of the MVP2 must make use of agile methodology, the service provider must develop and test using an iterative manner or process.

6 Key competencies & team compositions

The service provider must have a balanced team that has key competencies to cater for the various components of the project. Most importantly the service provider must be able to work with the technology stack provided in section 1 of this term of reference. A good ratio of senior to junior developers is important. The team must have demonstrable prior experience executing a project of this size and technical complexity and must comprised, at minimum, members with the following competencies:

- Business Analysis

- Front end (UI/UX) and Backend Development
- Blockchain Development
- Quality Assurance Automation Engineering
- DevOps Engineering
- Cloud Infrastructure Engineering
- Agile Project Management

We are cognisant that one company may not have all these competencies; in such a case, should the service provider opt to enter into a joint venture or similar arrangement, compliance documents must be furnished for every company proposed to be involved in said arrangement.

7 Finance

The service provider's financial proposal should provide an explicit budget with a detailed breakdown by level of cost and must contain itemised costs for the following broader deliverables: System analysis and requirements gathering; software development and testing; orientation training; and post-handover troubleshooting support cost for six months. Proposals must provide an explicit budget with a detailed breakdown by level of effort and daily rates. Payments will be made upon satisfactory completion and acceptance of deliverables by the JET-MerSETA team. Work is considered complete when functionality is demonstrated. As a result, payments will be based on deliverables and not the completion of sprints. All functions within a sprint or set of sprints need to be functional before invoices for payments are submitted.

The budget allocation for this task ranges between R1 million to a maximum of R3 million, all-inclusive of requirements such as VAT, venues for the workshops to be conducted, travel, and any other expenses incurred in the roll out of the project until final successful completion. Proposals with a total budget over R3 million will not be entertained.

All costs associated with the development, preparation, production and/or delivery of goods and/or services incurred without an executed contract copy signed by all parties will be for the account of the bidding company or organisation. Neither JET nor the merSETA will pay for any costs associated with the development, preparation, production and/or delivery of goods and/or services connected to these terms of reference.

8 Estimated time frames

Activity	Date
Clarification questions deadline	13 May 2022
Submission of proposals deadline	27 May 2022
Evaluation of submissions	30 May - 3 June 2022
Shortlisted service provider presentation date	6 - 10 June 2022
Commencement of work	4 July 2022
Inception	19 August 2022
System Design	19 September 2022
Approved prototype	26 September 2022
MVP development	September - January
Deploy	12 January 2023
Handover	12 February 2023
Completion	20 March 2023
Support	3 April - 27 October 2023

9 Contact details

All queries should be directed to Boitumelo Mancu and must be submitted via email to boitumelo@jet.org.za.

Responses will be provided via email. Proposals should be submitted to tenders@jet.org.za. Technical and financial proposals may be combined.

Annexure A: Backlog

Backlog 12

Summary	User Story	Related Feature
[DEV] Expose an API to view individuals credentials	As the PSET Cloud I want to be able to expose an API for trusted third party systems to query for a consolidated view of an individual's credentials with a mandate from the relevant individual	PSET CLOUD
[DEV] View Trends & Insights	As an educational institute I want to be able to view trends and insight in the supply and demand of various learning opportunities	Educational Institute
[DEV] Engage with Job Seekers	As an employer I want to be able to engage job seekers on available opportunities, sending and responding to queries as necessary.	Employer
[DEV] Remove registered individuals who act obo organisation	As an employer I want to remove registered individuals from my organisation so that they can no longer act on behalf of the organisation on the PSET cloud	
[DEV] Add registered individuals to act obo organisation	As an employer I want to add registered individuals to my organisation so they can act on behalf of the organisation on the PSET cloud	
[DEV] Offer employment opportunities	As an employer I want to create an organisation that offers employment opportunities so I can get high quality graduates.	
[DEV] Engage with Educational Institutes	As a learner I want to be able to engage an educational institute on available learning opportunities sending and responding to queries as necessary	Learner
[DEV] View different types of learning opportunities	As a learner I want to be able to view information on the different types of learning opportunities available and relevant to me	
[DEV] Learning opportunities notifications [Automated]	As a learner I want to be able to subscribe and receive notifications for learning opportunities the system automatically matches me with	
[DEV] View Learning opportunities [Automated]	As a learner I want to be able to view learning opportunities that the system automatically matches me with based on my registration	

Backlog 13

Summary	User Story	Related Feature
[DEV] Approve/Reject changes of content	As an administrator I want to be able to approve or reject with reasons the creation updates or deletion of content automatically and manually	Administrator
[DEV] Approve/Reject changes for Opportunities	As an administrator I want to be able to approve or reject with reasons the creation updates or deletion of opportunities automatically and manually	
[DEV] Approve/Reject changes for Organisations	As an administrator I want to be able to approve or reject with reasons the creation updates or deletion of organisations automatically and manually	
[DEV] Admin login obo registered individual	As an administrator I want to be able to log in as a specific registered individual with their consent to assist with queries	
[DEV] Engage with Learners	As an educational institute I want to be able to engage learners on available learning opportunities, sending and responding to queries as necessary.	Educational Institute
[DEV] Capture/Update learning opportunities	As an educational institute I want to be able to capture or update learning opportunities	
[DEV] Remove registered individuals who act obo organisation	As an educational institute I want to remove registered individuals from my organisation so that they can no longer act on behalf of the organisation on the PSET Cloud	
[DEV] Add registered individuals to act obo organisation	As an educational institute I want to add registered individuals to my organisation so they can act on behalf of the organisation on the PSET cloud	
[DEV] Create an Organisation	As an educational institute I want to create an organisation that offers learning opportunities.	
[DEV] Learning opportunities notifications	As a learner I want to be able to subscribe and receive notifications for learning opportunities based on criteria I specify	Learner

Backlog 14

Summary	User Story	Related Feature
[DEV] Enable/Disable Automatic Validation of Organisations	As an administrator I want to be able to enable and disable automatic validation of organisations based on identification number	Administrator
[DEV] Enable/Disable Automatic Validation of Individuals	As an administrator I want to be able to enable and disable automatic validation of individuals based on identification number	
[DEV] Verify organisation's identification	As an administrator I want to be able to verify an organisations registration	
[DEV] Verify individual's identification	As an administrator I want to be able to verify an individual's identification	
[DEV] Suspend Organisation's Account	As an administrator I want to be able to suspend an organisation with reasons where applicable	
[DEV] Suspend Individual's Account	As an administrator I want to be able to suspend an individual's account with reasons where applicable	
[DEV] Add educational institutes to Platform	As an administrator I want to be able add educational institutes to the PSET Cloud	
[DEV] Add Employers to Platform	As an administrator I want to be able add employers to the PSET Cloud	
[DEV] Add Learners to Platform	As an administrator I want to be able add learners to the PSET Cloud	
[DEV] Add Job Seekers to Platform	As an administrator I want to be able add job seekers to the PSET Cloud	
[DEV] Create & Update DB of credentials	As an Administrator I want to be able to create and update a database of credentials so that individuals and organisations can more easily work with credentials and opportunities respectively. This will also make data more consistent and subsequent analysis easier and more relevant.	

Backlog 15

Summary	User Story	Related Feature
[DEV] Create & Update a database of types of employment opportunities	As the PSET Cloud I want to be able to interrogate trusted third-party systems to create and update a database of types of employment opportunities so that job seekers and organisations can more easily work with opportunities. This will also make data more consistent and subsequent analysis easier and more relevant	PSET CLOUD
[DEV] Create & Update a database of types of learning opportunities	As the PSET Cloud I want to be able to interrogate trusted third-party systems to create and update a database of types of learning opportunities so that learners and organisations can more easily work with opportunities. This will also make data more consistent and subsequent analysis easier and more relevant	
[DEV] Create & Update a database of credentials	As the PSET Cloud I want to be able to interrogate trusted third-party systems to create and update a database of credentials so that individuals and organisations can more easily work with credentials and opportunities respectively. This will also make data more consistent and subsequent analysis easier and more relevant.	
[DEV] Match registered individuals with learning opportunities	As the PSET Cloud I want to be able to interrogate trusted third-party systems for data to better match registered individuals with learning opportunities. This should be done with the consent of the organisations offering these opportunities.	
[DEV] Query trusted 3rd party systems for Employment Opportunities	As the PSET Cloud I want to be able to query trusted third-party systems for an employment opportunities	

Backlog 16

Summary	User Story	Related Feature
[DEV] Query trusted 3rd party systems for individuals' Credentials	As the PSET Cloud I want to be able to query trusted third-party systems for credentials with the consent of the relevant individuals	PSET CLOUD
[DEV] Query trusted 3rd party systems for Learning Opportunities	As the PSET Cloud I want to be able to query trusted third-party systems for a learning opportunities	
[DEV] Discover insight on learning opportunities	As the PSET Cloud I want to be able to interrogate trusted third-party systems for data to discover insight on learning opportunities. This should be done with the consent of the organisations or individuals that own the data or where appropriate privacy controls have been put in place.	
[DEV] Discover insight on employment opportunities	As the PSET Cloud I want to be able to interrogate trusted third-party systems for data to discover insight on employment opportunities. This should be done with the consent of the organisations or individuals that own the data or where appropriate privacy controls have been put in place.	
[DEV] Match registered individuals with employment opportunities	As the PSET Cloud I want to be able to interrogate trusted third-party systems for data to better match registered individuals with employment opportunities. This should be done with the consent of the organisations offering these opportunities.	

Backlog 17

Summary	User Story	Related Feature
[DEV] Pull credentials from NLRD	As a learner I want the PSET Cloud with my consent to pull my credentials in from the NLRD managed by SAQA.	Administrator
[DEV] Pull organisation's employment opportunities captured on ESSA	As an employer I want the PSET Cloud with my consent to be able to pull in my organisation's employment opportunities captured on ESSA.	Employer
[DEV] Obtain Credentials from SAQA	As a job seeker I want the PSET Cloud with my consent to pull my credentials in from the NLRD managed by SAQA	Job Seeker
[DEV] Obtain Employment Information	As a job seeker I want the PSET Cloud with my consent to pull my CV and employment application information from ESSA	

Annexure B: PSET CLOUD Theory of change

