



Support and Maintenance of STEM Ambassadors Digital Platform

Invitation to Tender

National STEM Learning Centre, University of York, Heslington, York, North Yorkshire, YO10 5DD
Tel +44 (0) 1904 328300 **Fax** +44 (0) 1904 328328 **Email** enquiries@stem.org.uk **Website** www.stem.org.uk

STEM Learning operates the National STEM Learning Centre and Network, and other programmes supporting STEM education.

STEM Learning Ltd, registered in England and Wales, Company Number 05081097.

Contents

1	Project Summary.....	4
2	Background	5
2.1	About STEM Learning.....	5
2.2	About STEM Ambassadors	5
2.3	About STEM Ambassador Digital Platform	6
3	System overview	7
3.1	User Roles	7
3.1.1	Ambassador	7
3.1.2	Teachers and Youth Group Leaders (“Clients”)	7
3.1.3	Hub Users	7
3.1.4	STEM Learning Users.....	7
3.1.5	Partners/Employers	7
3.2	Principal System Entities.....	8
3.2.1	Activity	8
3.2.2	Offer	8
3.3	User/System Interactions	8
3.4	Principal journeys.....	11
3.4.1	User Registration.....	11
3.4.2	Activity creation	12
3.4.3	Offer Creation	14
3.5	General Functionality: Search and filter lists	15
3.6	System environment and Infrastructure.....	16
3.7	System integrations	16
3.8	Hosting	17
4	Project Scope	18
4.1	Technical Requirements.....	18
4.1.1	Support.....	18
4.1.2	Continuing Development	18
4.2	Non-Technical Requirements.....	19
4.3	Estimated Contract Value	19

5	Your response	20
5.1	Costings.....	20
5.2	Outline Approach to take-on	20
5.3	Resource Management.....	20
5.4	Management of codebase	20
5.5	Team structure and experience	21
5.6	Examples of similar projects	21
5.7	Organisation information.....	22
5.8	Example Terms and Condition	22
5.9	Client referees.....	22
6	Acceptance of Proposals	22
7	Criteria for selection	23
8	Conditions of participating in this Invitation to Tender (ITT).....	23
8.1	Agreement	23
8.2	Ownership of ITT documents.....	23
8.3	Compliance, partial compliance or non-compliance	24
8.4	Suppliers to inform themselves	24
8.5	Suppliers to meet tendering costs	24
9	Timeline for ITT Summary	25

1 Project Summary

This project is the opportunity is to take over the support, maintenance and ongoing development of our STEM Ambassadors digital platform (SADP), both front and backend.

The SADP supports the acquisition, engagement, and retention of STEM Ambassadors; collection of opportunities for STEM Ambassadors from schools, colleges and non-school groups; matching of STEM Ambassadors with those opportunities; and gathering and reporting of feedback and statistics.

We are looking for a partner to provide support and development services for our platform software and related environments. This document outlines our requirement and includes guidance on submitting a proposal of how you could work with us on an ongoing basis of support and continuous improvement.

2 Background

2.1 About STEM Learning

STEM Learning is dedicated to supporting science, technology, engineering and mathematics (STEM) education across the UK by working with and developing teachers and technicians who work with young people across the education system; and finding and positioning volunteer STEM Ambassadors in schools to help raise awareness of STEM careers.

Our vision is to achieve a world-leading STEM education for all young people across the UK, regardless of background, to help meet the ever-increasing demand for a skilled workforce.

Through our UK-wide Network, STEM Learning has unrivalled reach across and impact on schools and colleges:

- we work with 100% of secondary schools, post-16 and FE colleges, and 80% of primary schools - online, face-to-face and in-school
- over 20,000 teachers of STEM subjects, working with more than 2 million young people, engage with STEM Learning's professional learning programmes each year
- 35,000 STEM Ambassadors from 2,500 employers give their expertise to inspire young people, teachers, families and communities about STEM subjects and careers
- over 150,000 teachers are registered with our website, which sees 1 million page views and 100,000 resource downloads per month

All our programmes and projects are designed to have a positive impact on participants to ensure that we have a high impact on the STEM education of young people.

2.2 About STEM Ambassadors

We run the UK's only network of STEM Ambassadors: over 35,000 brilliant and inspiring volunteers who give their time and support to promote STEM subjects to young people in a wide range of original, creative, practical and engaging ways.

They are an invaluable and free resource for teachers, helping to deliver the STEM curriculum and raise awareness of potential careers by revealing how essential STEM is throughout the world.

Our STEM Ambassadors are coordinated across the UK by 19 STEM Ambassador Hubs. These Hubs are contracted by STEM Learning to manage STEM Ambassador activities in a specific geographical area.

2.3 About STEM Ambassador Digital Platform

The primary purpose of the SADP is to facilitate the engagement of Ambassadors with young people, which it does in the following ways:

- It allows Teachers and Youth Group Leaders to arrange STEM activity events and advertise them to STEM Ambassadors, who can offer their services in delivering the desired activity.
- It allows STEM Ambassadors to advertise predefined activities to Teachers and Youth Group Leaders who may choose to engage the Ambassador to deliver their activities.

The platform was launched in January 2018, and currently hosts around 53,000 Ambassador volunteers, with approximately 20,000 Ambassadors actively engaging in Activities on a regular basis.

In the last 12 months 44,000 STEM Ambassadors Activities have been created on the platform, resulting in approximately 540,000 hours of volunteer participation.

3 System overview

The SADP is built in PHP on the Symfony framework. This manages all the STEM Ambassador profiles, activities, offers, matching, feedback and reporting. It is closely integrated with our Drupal 7 website which has a significant established user-base of teachers and others involved in STEM education.

3.1 User Roles

3.1.1 Ambassador

STEM Ambassadors are volunteers from a wide range of science, technology, engineering and mathematics (STEM) related jobs and disciplines across the UK. STEM Ambassadors participate in activities in schools and with youth groups to help bring STEM subjects to life and demonstrate the value of them in life and careers.

3.1.2 Teachers and Youth Group Leaders (“Clients”)

Schools, colleges and non-school groups (e.g. Scout groups, Girl Guides, youth groups) generate the activities that STEM Ambassadors take part in, so we need to ensure they have the smoothest experience possible in advertising their opportunities, finding the most suitable STEM Ambassadors to take part, and feeding back on the impact they have gained from them.

3.1.3 Hub Users

Our STEM Ambassadors are trained, supported and managed at a local level through STEM Ambassador Hubs. These STEM Ambassador Hubs also support the schools, colleges and non-school groups by connecting them to STEM Ambassadors that they think would be appropriate for the opportunities they are offering.

3.1.4 STEM Learning Users

In order for STEM Learning to be able to continually improve their offer to both STEM Ambassadors and schools, colleges and non-school groups, it is important we have the most accurate and easy-to-understand view of the data we collect. We therefore need to support our STEM Learning staff with the right tools to understand all the different STEM Ambassador stakeholders.

3.1.5 Partners/Employers

STEM Learning work closely with partner organisations (e.g. professional institutions, trade bodies and large employers) to provide community engagements. The SADP supports these organisations in facilitating these engagements.

3.2 Principal System Entities

3.2.1 Activity

In the platform, an Activity is a real-world event (or series of events) where an Ambassador will engage with pupils or students. Each Activity is categorised to allow Activities to be matched to Ambassadors and surfaced via searching/browsing.

The most common Activity creation scenario is when a teacher creates an Activity and Ambassadors apply to participate. Multiple Ambassadors may apply for the same Activity, and some Activities will require multiple Ambassadors

3.2.2 Offer

Ambassadors can create an offer for an activity, that a 'client' can then express interest in and create an activity based off an Ambassadors expertise.

This will allow clients to find offers to supplement their learning/group purpose without having to put up their own activity. It will allow ambassadors to showcase their skills and help run sessions that they can excel in.

3.3 User/System Interactions

The following diagram outlines the major entities involved in the SADP, and their relationships with each other:

Support and Maintenance of STEM Ambassadors
Digital Platform – Invitation to Tender
V1.0

The relationships are further described in the table below:

Table 1: SADP Entity Relationships

Source entity	Relationship	Destination Entity	Notes
Activity	takes place within	Local Authority	An Activity will take place at a specified postcode. The Activity will be associated with the Local Authority within which that postcode sits. This is used to derive Hub ownership of the Activity
Activity	may be created from	Offer	An Offer may be used as a "template" upon which a new Activity is based
Activity Ambassador Feedback	is associated with	Activity	Activity feedback will be collected for each Activity from each Ambassador that participated in it.
Activity Client Feedback	is associated with	Activity	Activity Feedback will be collected for each Activity from the Client by (or for) whom the Activity was created
Ambassador	creates	Offer	Ambassadors can create Offers to advertise examples of Activities that they are able to provide
Ambassador	participates in	Activity	Ambassadors volunteer to participate in Activities created by a Client
Ambassador	provides	Activity Ambassador Feedback	Upon completion of an Activity, Ambassadors are required to provide feedback on the effectiveness of the Activity
Ambassador	works at	Organisation Location	Ambassadors provide the location of their employment
Ambassador	is employed by	Employer	Ambassadors provide details of their Employer
Ambassador	operates within	Local Authority	Ambassadors will operate within a radius of a given postcode. The Ambassador will be associated with the Local Authority within which that postcode sits. This is used to derive Hub ownership of the Ambassador account
Employer	is populated from lookup of	Organisation	An Ambassador's Employer details are populated by referencing the existing Organisations within SADP. If the organisation does not exist, the Ambassador will provide details
Hub User	works at	Hub	Each Hub User will be associated with one Hub
Local Authority	is administered by	Hub	Each Local authority is associated with one "owning" Hub. This Hub has principal responsibility for all SADP activity within the Local Authority
Non-school Group	provides	Activity Client Feedback	NSG will create Activities for Ambassadors to participate in. This is somewhat equivalent to a "request" in STEMNET
Non-school Group	creates	Activity	Upon completion of an Activity, NSGs are required to provide feedback on the effectiveness of the Activity
Non-school Group	responds to	Offer	NSG can browse and respond to Offers that have been advertised by Ambassadors
Organisation Location	belongs to	Organisation	Each Organisation Location must be associated with an "owning" Organisation.
School	is located within	Local Authority	A School will take place at a specified postcode. The School will be associated with the Local Authority within which that postcode sits. This is used to derive Hub ownership of the School

School	participates in	Activity	An Activity will take place for 1 or more School(s). Recording School participation is required for KPI reporting
School	is also recorded as	Organisation	In addition to the School record, the School details are recorded in SADP as an Organisation
School	is populated from	Achiever	School details are populated in SADP by frequent synchronisation with the Achiever API
Teacher	is employed by	School	Upon registration, a Teacher is required to specify the school at which they are employed. This is recorded in Drupal and passed to SADP via API (passing Achiever School ID) at authentication
Teacher	creates	Activity	Teachers will create Activities for Ambassadors to participate in. This is somewhat equivalent to a "request" in STEMNET
Teacher	provides	Activity Client Feedback	Upon completion of an Activity, Teachers are required to provide feedback on the effectiveness of the Activity
Teacher	responds to	Offer	Teachers can browse and respond to Offers that have been advertised by Ambassadors
User	is created from	Drupal User	All user accounts in SADP are associated with a "Base" Drupal account. The Drupal user account is used for authentication and user membership management (password reset, etc.)
User	is Teacher	Teacher	SADP stores a Teacher profile, if the Drupal user is type: Teacher. Teacher is a Sub-class of User
User	is Non-school Group	Non-school Group	SADP stores an NSG profile, if the Drupal user is type: NSG. NSG is a Sub-class of User
User	is Ambassador	Ambassador	SADP stores an Ambassador profile, if the Drupal user is type: Ambassador. Ambassador is a Sub-class of User
User	is Employer User	Employer User	SADP stores an Employer User profile, if the Drupal user is type: Employer. Employer is a Sub-class of User (NOTE: NOT IMPLEMENTED)
User	is Hub User	Hub User	SADP stores a Hub User profile, if the Drupal user is type: Other and has been allocated a Hub User role within SADP. Hub User is a Sub-class of User
User	is STEM User	STEM User	SADP stores a STEM User profile, if the Drupal user is type: Other and has been allocated a STEM User role within SADP. STEM User is a Sub-class of User

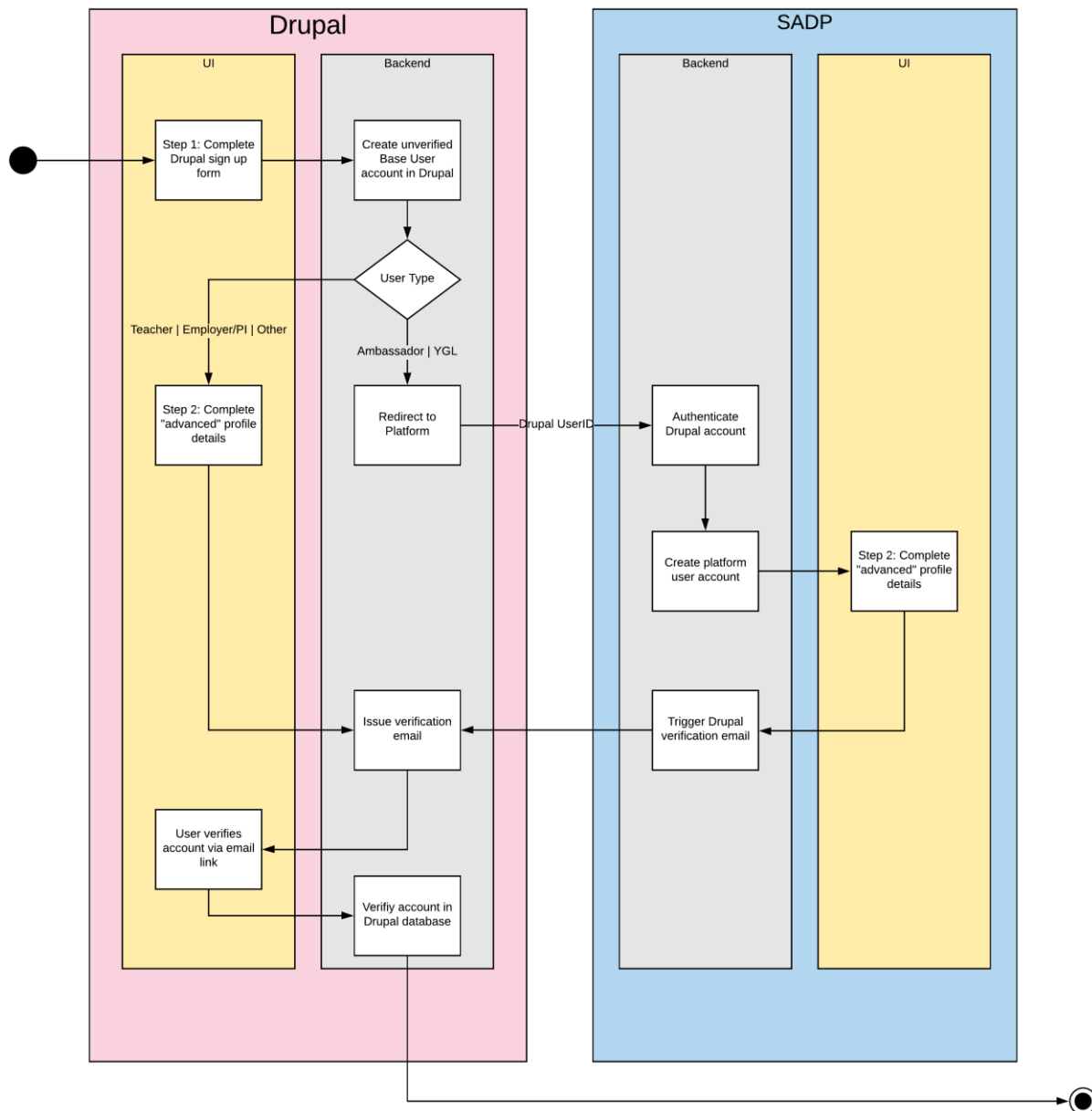
3.4 Principal journeys

3.4.1 User Registration

All user registrations are initiated on the Drupal platform, to maintain continuity with the existing www.stem.org.uk website. However, users are forked after the initial step with the platform handling extended STEM Ambassador user data, and Drupal maintaining the teacher user base.

All user authentication is managed through Drupal, as is basic account management (password resets/email account details etc.).

The user sign-up process is shown below:



3.4.2 Activity creation

The creation and management of Activities is the primary purpose of the SADP.

The Activity creation process is:

1. Teacher creates a new Activity
2. An Ambassador discovers the Activity via matching, search or browse

3. The Ambassador registers interest in Activity
4. Teacher and Ambassador discuss the requirement. Offline, “real world” communication is to be encouraged, (e.g. phone calls)
5. Teacher makes offer to Ambassador
 - OR declines the Ambassador’s registration of interest
6. If offer is made, Ambassador confirms their acceptance, and records their personal goals for the Activity (“Success Criteria”).
 - The Ambassador can decline the offer, if they wish
7. The Activity will take place during the appointed date range
8. Once the Activity has taken place, Teacher and Ambassador must record feedback on the Activity.

Email notifications are sent to both parties at key stages of the process.

This process is summarised in the following diagram:

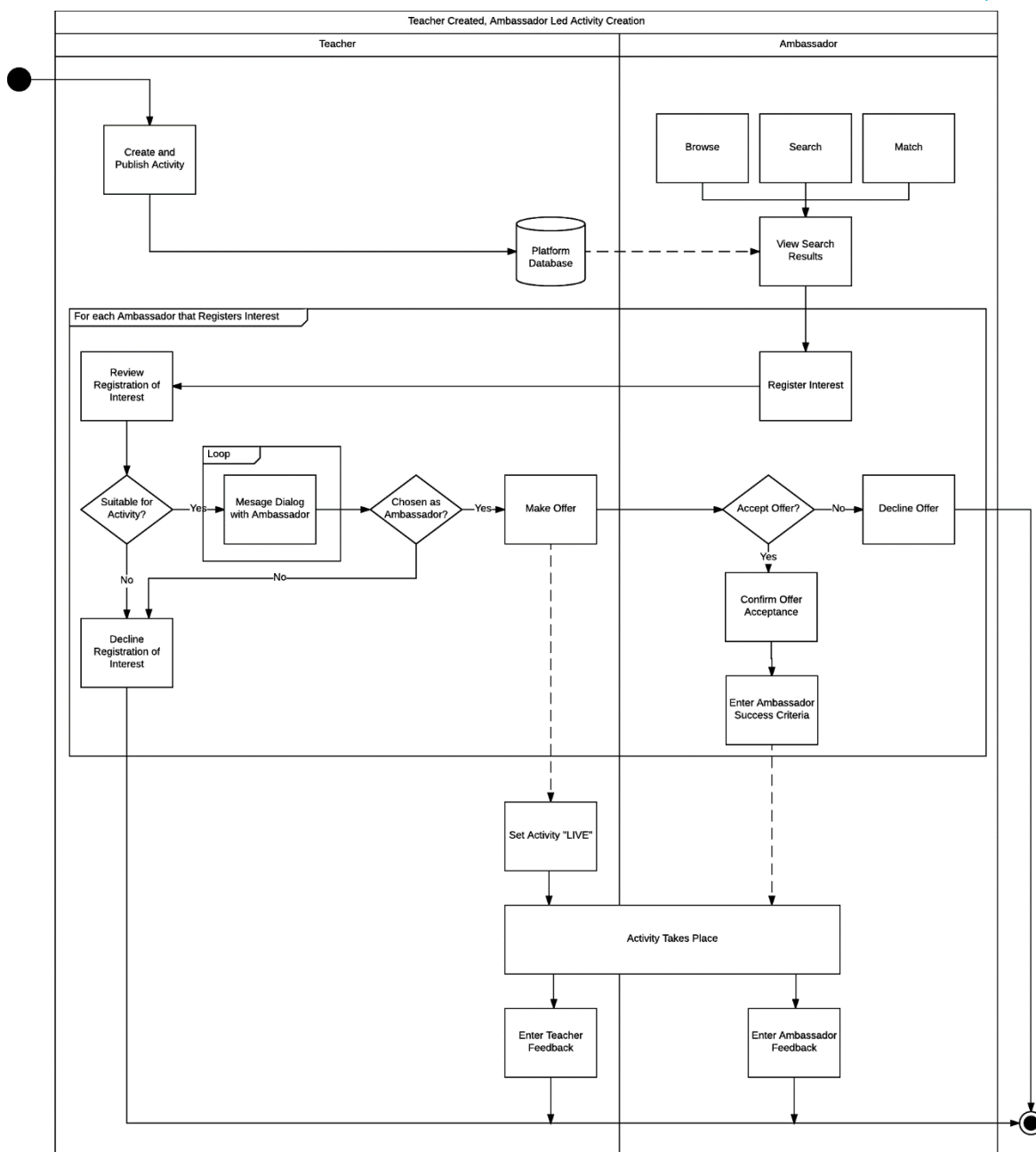


Figure 2: Teacher Created Activity, Principle User Journeys

3.4.3 Offer Creation

An alternative route for the creation of an Activity is via an “Offer”. For example, an Ambassador may have a pre-prepared Activity that they have delivered several times and wish to make it available to Teachers in the future. This has two advantages: 1) Ambassadors can

increase their engagement in the Platform by offering pre-defined Activities and 2) Teachers may discover Activities that they would not otherwise have been aware of.

The Offer-to-Activity creation process is:

1. Ambassador creates and Offer and advertises it on the SADP
2. A Teacher discovers the Offer via search or browse
3. Teacher and Ambassador discuss the requirement. Offline, “real world” communication is to be encouraged, (e.g. phone calls)
4. Ambassador agrees to deliver the offered Activity
5. Teacher creates a new Activity based on the Offer
6. Ambassador confirms their participation and records their personal goals for the Activity (“Success Criteria”).
7. Activity follows standard Activity lifecycle

Email notifications are sent to both parties at key stages of the process.

This process is summarised in the following diagram:

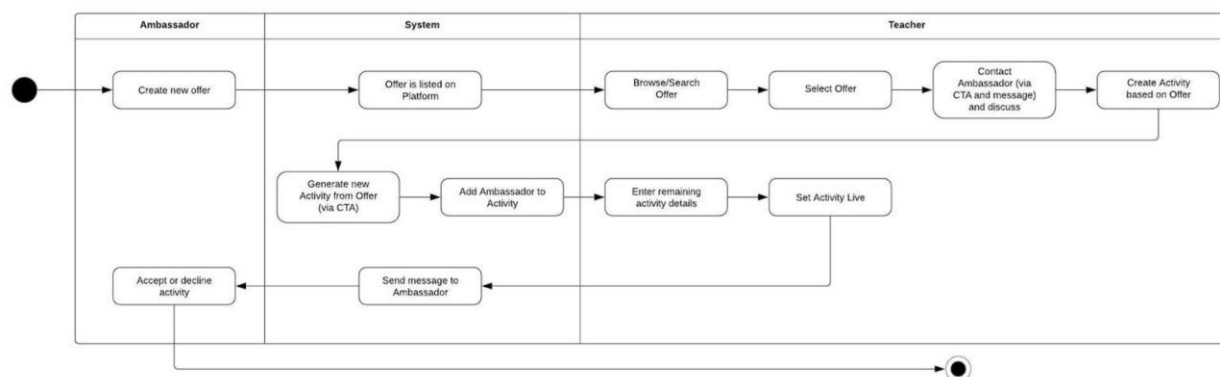


Figure 3: Activity created from Offer, Principle User Journeys

3.5 General Functionality: Search and filter lists

For each of the main data entities modelled within the SADP, can be browsed, filtered and sorted from a dedicated list view.

Browse Activities

388 Activities found

Download results as CSV

NAME	TYPE	OWNER	LOCATION NAME	LOCATION POSTCODE	START DATE ▲	END DATE	ACTIONS
Weather vs Climate topic hook	STEM presentation e.g. assembly or learning		New Haw Community School		21/04/2020	21/04/2020	
Climate change Science Week 9-13th March 2020	Hands on practical		Wash Green		10/03/2020	10/03/2020	
Climate Change Science Week	STEM presentation e.g. assembly or learning		Holyrood Catholic Primary School		10/02/2020	10/02/2020	
Climate Change Talk	STEM presentation e.g. assembly or learning		Marton Road		09/02/2020	09/02/2020	
Climate change	STEM careers talk and/or advice session		Collaton St. Mary School		27/01/2020	03/04/2020	Complete activity
REQ1249: Climate Change in the Boardroom at BTE Academy	Judging a STEM competition/challenge		Bristol Technology Engineering Academy		17/12/2019	17/12/2019	
Sustainability and Climate Change	STEM presentation e.g. assembly or learning		Christ College		06/12/2019	06/12/2019	

Search filters

Refine

Keywords

climate

Distance

from

Starts after

DD/MM/YYYY

Finishes before

DD/MM/YYYY

Finishes after

Figure 4: Entity List View

Access to a given list is dependent on user role. Search and filter functionality is provided via Elastic Search. List contents can be downloaded as CSV files by STEM and Hub Users.

3.6 System environment and Infrastructure

The SADP is a single, custom-built web application, written in PHP using the Symfony framework, with a MySQL data repository. Search functionality is provided by Elastic Search.

- PHP version: 7.2
- MySQL version: 5.7
- Symfony version: 3.4.23
- Elastic Search version: 5.6.8.

3.7 System integrations

The SADP integrates with several third-party systems:

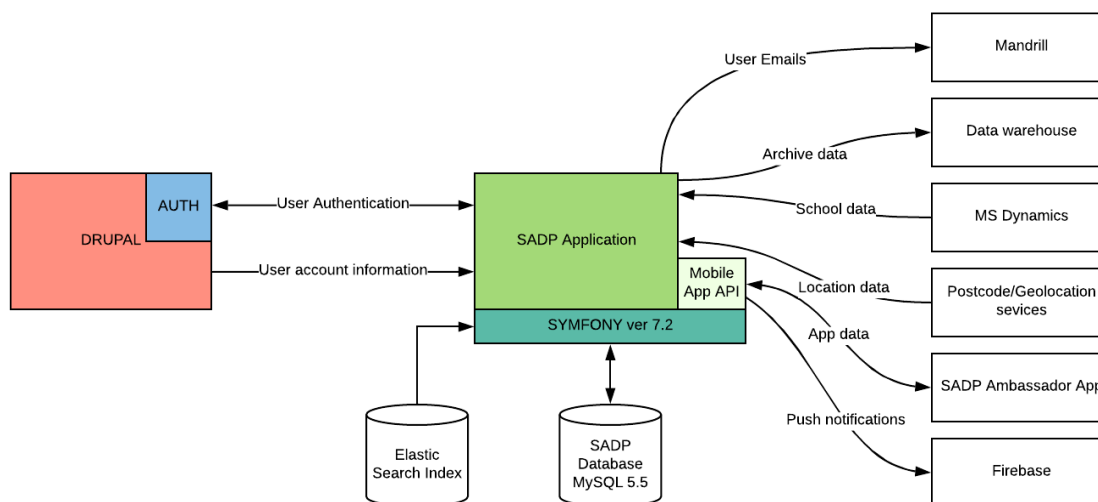


Figure 5: SAMP environment and integrations

- **Drupal:** All base user accounts for the SAMP are created and maintained in our Drupal content management and membership system. Authentication to the SAMP is provided by Drupal via OAuth2. In addition, selected account profile information is synchronized from Drupal.
- **Mandrill:** The SAMP uses Mandrill to provide rich content email templates for automated notifications. Emails are generated by real-time user actions, and by scheduled script execution.
- **STEM Ambassador App:** The SAMP includes custom-written API to communicate with our Ambassador mobile app. Push notifications to the App are performed via Firebase.
- **Postcode look up:** The SAMP uses api.getaddress.io for postcode information
- **Google Maps:** The SAMP uses Google Maps Geocoding API to display maps and provide additional location information to the system
- **Microsoft Dynamics:** School data is managed through a Microsoft Dynamics implementation, which has a maintained copy of school data from the government Edubase system. This data is imported into the SAMP through calls to a custom Dynamics API.
- **Data warehouse:** A range of data from the SAMP is imported into STEM Learning's data warehouse system on a nightly basis via Azure Data Factory.

3.8 Hosting

The SAMP is hosted on Amazon AWS web servers.

4 Project Scope

We are looking for a partner organisation to take on the support, maintenance and continuing development of the SADP. Your response should address your organisation's capability and in meeting the following technical and non-technical requirements. Please cite any relevant experience.

4.1 Technical Requirements

The successful candidate will be expected to:

4.1.1 Support

4.1.1.1 Platform Support

- Work closely with our in-house support helpdesk to triage, diagnose and fix bugs and issues reported by our user base, to an agreed SLA. The SADP currently generates around 30 to 60 hours of support issues per month.
- Maintain the application codebase
- Maintain relevant and adequate technical documentation
- Manage all development and release systems, mechanisms and processes

4.1.1.2 Database Support

- Perform database performance monitoring and tuning
- Maintain the reliable data transfer from the SADP to the STEM data warehouse

4.1.1.3 Hosting and infrastructure support

- Provide proactive security and stability patching of the relevant infrastructure
- Provide proactive monitoring of critical systems performance; pre-emptively identify potential performance degradation.

4.1.1.4 Business continuity/disaster recovery

- Create, maintain and adhere to a suitable backup strategy in order to meet the agreed recovery point and recovery time objectives required for the service. Regular backup recovery testing must be carried out and disaster recovery testing carried out annually.

The SADP has a projected lifespan of at least 2 years from the commencement of the proposed engagement.

4.1.2 Continuing Development

- Work in collaboration with our Product Team to scope, specify and implement new planned features in the SADP. We project that we will require 2 to 3 FTE developers for the first 6 months following the commencement of this engagement.

4.2 Non-Technical Requirements

STEM Learning is committed to collaborative working and our choice of partner will be highly influenced by your approach and working practices. Your response should address:

- Your approach to requirements elicitation and development specification
- Your approach to Project Management and Change Management
- Your approach to Quality Assurance and software testing
- Your approach to CI/CD, including your preferred tools and examples where this has been successfully implemented
- Your approach to domain knowledge retention and sharing within the organisation
- Your approach to staff onboarding, handover and backfill

4.3 Estimated Contract Value

Based on the current development and support activity on the platform, and accounting for potential development over the coming year, we estimate the value of the engagement to be between £160,000 and £500,000.

5 Your response

As well as a response to the non-technical and technical requirements outlined in the sections above, your proposal should include the information detailed below, as a minimum. Please try to keep written responses to around a maximum of 20-30 pages.

5.1 Costings

Your response should include:

- An estimated cost for service transition and onboarding
- Rate card for team roles, which must include the following roles
 - Developer (detail all experience levels available)
 - Project Manager
 - QA technician
- A cost for an initial 1 year of support as outlined in Section 4.1.1 (Support), including indicative support Service Level Agreements.

5.2 Outline Approach to take-on

Your response should include an outline of how you would manage the transition of the service. Please include:

- what discovery activities would you undertake
- what steps you would take to ensure a smooth transition
- a high-level project plan and timescales for the above

5.3 Resource Management

Please provide an outline of how you would manage resource allocation for the provision of services. You should describe your capability to scale the team size in response to varying requirements from our business, and your approach to onboarding and domain knowledge sharing.

5.4 Management of codebase

The ownership of the IPR and all associated code (existing and future) will remain exclusively with STEM Learning Ltd. The complete codebase should be fully visible and accessible to STEM Learning at all times whilst being managed by your organisation.

Please provide an outline of your approach to managing and maintaining our codebase and associated artefacts.

5.5 Team structure and experience

Please provide detailed information regarding the team you propose to meet our requirements. Please include staff profiles outlining job roles, relevant experience and qualifications.

5.6 Examples of similar projects

Suppliers are encouraged to provide examples of previous work undertaken of a similar type and scope. We will have a particular interest in:

- Enterprise-level Symfony developments
- Projects for the transition into support and BAU of an existing codebase

5.7 Organisation information

Please provide the following:

- Name of tenderer and registered company number
- Place of business and postal address
- Contact person's name and title including telephone and email address
- Provide the name and contact details of the tenderer's principal accountant who may be asked to provide your organisation's audited accounts for the past three years in order to verify financial viability.
- Sub-contractor agreements - provide details of any agreement with any proposed subcontractor.
- Information security policies or any applicable information security standards you hold (eg ISO27001).

5.8 Example Terms and Condition

Please provide a copy of your standard terms and conditions for similar projects.

5.9 Client referees

Provide the contact details of three client referees for whom you have developed similar websites and systems and whom we are able to contact if required. Please provide a brief description of the web project relevant to each referee.

6 Acceptance of Proposals

Please send your proposals electronically to both primary and secondary contacts:

Primary contact:

Doug Faulds (Consultant Project Manager)

doug@centrocol.com

0773 996 9139

Secondary contact:

Matt Holmes (Head of IT)

m.holmes@stem.org.uk

01904 328187

All proposals will be acknowledged within 24 hours of receipt. Where required, documents can be sent via secure file transfer. Please enquire for details if required.

Questions or requests for further information that arise during the proposal preparation stage should be sent to Doug Faulds at the above email address.

The deadline for receipt of proposals is **14th February at 5PM**

7 Criteria for selection

The criteria for selection are:

- Credibility and proven expertise in developing enterprise solutions
- A track record of developing digital products for education, charity or public sectors
- Value for money
- Track record in hosting and securing web applications or managing the hosting thereof
- Operations/DevOps setup
- Effective project management skills
- Excellent communication skills

We aim like to hold pitch sessions with each of the potential suppliers on week commencing 9th March 2020. The sessions will be held at the National Science Learning Centre, University of York, YO10 5DD.

We aim to tell you on 21st February 2020 whether we would like to invite you to one of these workshops. The aim of the workshop is to give us an opportunity for us all to meet the people we would be working with and to discuss aspects of the proposal which are of particular interest or concern (these timescales are subject to change). We would expect the Project Manager you would assign to the project in attendance as well as any other key team members that would be working with us.

8 Conditions of participating in this Invitation to Tender (ITT)

8.1 Agreement

The successful supplier will be required to enter into a formal contract with STEM Learning.

8.2 Ownership of ITT documents

All documents will become the property of STEM Learning on submission. We may make copies of the tender documents for any purpose related to this project.

8.3 Compliance, partial compliance or non-compliance

The supplier will be taken to agree or comply with all conditions of all parts of this document unless the specified otherwise, giving reasons.

8.4 Suppliers to inform themselves

Suppliers responding to this ITT are responsible for taking all necessary steps to inform themselves of STEM Learning requirements, terms and conditions in regard to tendering for this project.

8.5 Suppliers to meet tendering costs

Suppliers responding to this ITT are to meet all costs of responding to this document, including preparation, submission, lodgement and negotiation costs.

9 Timeline for ITT Summary

ITT released	w/c 27 th January 2020
Shortlist	w/c 17 th Feb
Refinement Clarification	w/c 24 th Feb
Shortlist presentations	w/c 9 th of March 2020
Contract Award	w/c 16 th of March 2020
Handover/migration complete	1 st June 2020