

Users and Innovation Development Model

- A1. The Users and Innovation development model is based on the experiences of the JISC Virtual Research Environments (VRE) programme¹ and describes design and development principles and good practice that prioritise the needs of users in the implementation of technology and practice.
- A2. The proposed approach takes elements from established software development methodologies, particularly Participatory Design, and Rapid Application Development. The combination of these represents an evolutionary approach to development where users and developers collaborate closely and share common understanding of the application being developed, thus leading to better quality and fitness-for-purpose of the software produced.

Activities – in Stages, Phases and Cycles

Activities and Deliverables

- A3. The model, shown in Figure 1, iteratively follows a 'figure of eight' cycle of development activities, assigned to stages (and mapping onto *phases* for the purpose of the Next Generation strand). Broadly these activities move participants through observations of need → generation of solutions (such as brainstorming) → technical development (building) → testing and integration into context → implementation → observation → and so on, iteratively refining the technology or practice development and implementing through piloting exercises.

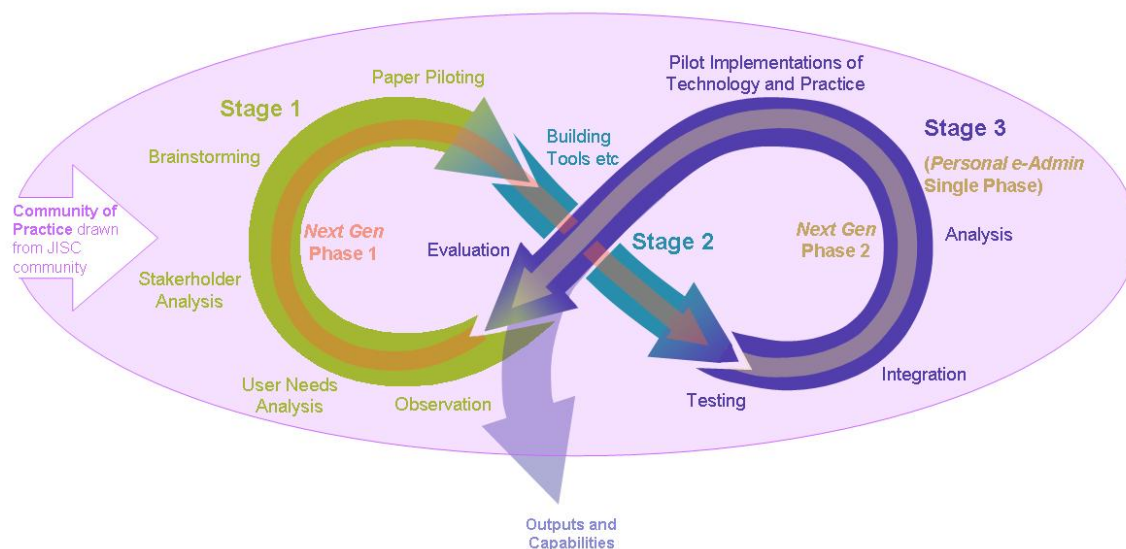


Figure 1: Users and Innovation Development Model

- A4. The activities and expected deliverables at each stage of the model are outlined in Table 1, below.

				Activity	Deliverable
Phase 1		Stage 1		Observation Identification of issues through a variety of techniques, both quantitative and qualitative.	Documentation identifying methodologies and results from observation.

¹ http://www.jisc.ac.uk/programme_vre.html

Phase 2	Stage 2	User Needs Analysis	Identification of needs and problems spaces and issues through direct consultation with users.	Evidence of the range of users engaged and the results of resulting analysis. This should also include a rationale of the analysis.
		Stakeholder Analysis	A wider approach to the identification of problem spaces and issues. Looking external pressures that may already be coming to bear on users or, through the application of scenario planning, identifying future issues.	Evidence of stakeholder analysis. Examples may include scenarios developed as a result of scenario planning workshops etc.
		Brainstorming	Generation of ideas that may provide solutions to issues and problems surfaced during the earlier stages.	Suggested solutions collated into an <i>ideas bank</i> that may be applicable to a range of issues or problem spaces identified during the earlier part of stage one.
		Paper piloting	Testing of various ideas to identify their validity before commitment to any particular technological solution, and certainly before commencing building of pilot solutions employing particular technologies. During this part of the cycle the team may perform further observation and user needs analysis before returning to more paper piloting.	Demonstration of how the concept will be applied and the outputs and outcomes expected from the application of a full technical build.
		Building	Following a successful paper pilot, a technical build may commence.	Project plan indicating build methodologies, regular reports, progress reports, regular software releases.
		Testing	Testing the built solution against criteria. These may include standards and issues identified during earlier stages, such as user needs analysis	Evidence of testing against agreed criteria.
Phase 3	Stage 3	Integration	Once the system has been tested it must be deployed in context.	Documentation supporting the integration of technology into other areas. Identification of, for example, interoperability issues.
		Analysis	Does the product still function in context in the way in which it was designed? Are there further adaptations to be made	Beta testing report within the context of deployment. Recommendations for adaptations. Identification of

			for contextual integration?	problems which could be addressed through further iteration around stages of the development model cycle(s).
			Implementation of technology and practice Using the product with users. Implementing the technology or practice in the context for which it was designed.	Deployment with users. Documentation for users and developers.
			Evaluation → Observation Evaluating the effectiveness of the technology or practice <i>in situ</i> and moving onto making more observations. Repeating cycles if necessary.	Process (cycle) evaluation report. Evaluation of technology or practice.

Table 1: Users and Innovation Development Model Activities

Stages

Stage One

- A5. Stage one can be broadly categorised as the *user engagement cycle*, where a broad range of issues are identified and ideas generated to alleviate them. This stage should lead to
- greater understanding of what the needs of users are;
 - generation of ideas based on observation of practice and technology;
 - rapid analysis of ideas through paper piloting.

Stage Two

- A6. Stage two is a *transition and decision stage*. Here, during further paper piloting and small-scale building (such as is accomplished by concept-proving “*mash-up*” of emergent technologies – see programme blog² it may be decided that the user engagement cycle is repeated and more ideas are generated before moving into paper piloting again. However, if paper piloting is satisfactory the model moves on to stage three.

Stage Three

- A7. Stage three is the *technical development cycle*, where solutions are built and tested. Technical development should be guided by the stage one, the *user engagement cycle*, to ensure that the technical solution meets the requirements of the target audience, users and stakeholders should continue to be involved in the Integration and Analysis stages.
- A8. Within the context of the Users and Innovation programme solutions may be built using existing tools and technologies from a range of sources, including other JISC programmes and services. New tools and functionality should be developed in cases where significant gaps have been identified and no existing open source tools or services exist. To suit a rapid style of development, projects should strive for short releases (e.g. every 8-12 weeks). Updates and bug fixes should also be made more frequently especially during the implementation periods. As the software will be used in real life conditions, its components must meet higher standards of quality, which puts an additional emphasis on the quality of the technical design as well as on system testing.

Phases of Next Generation Strand Activity

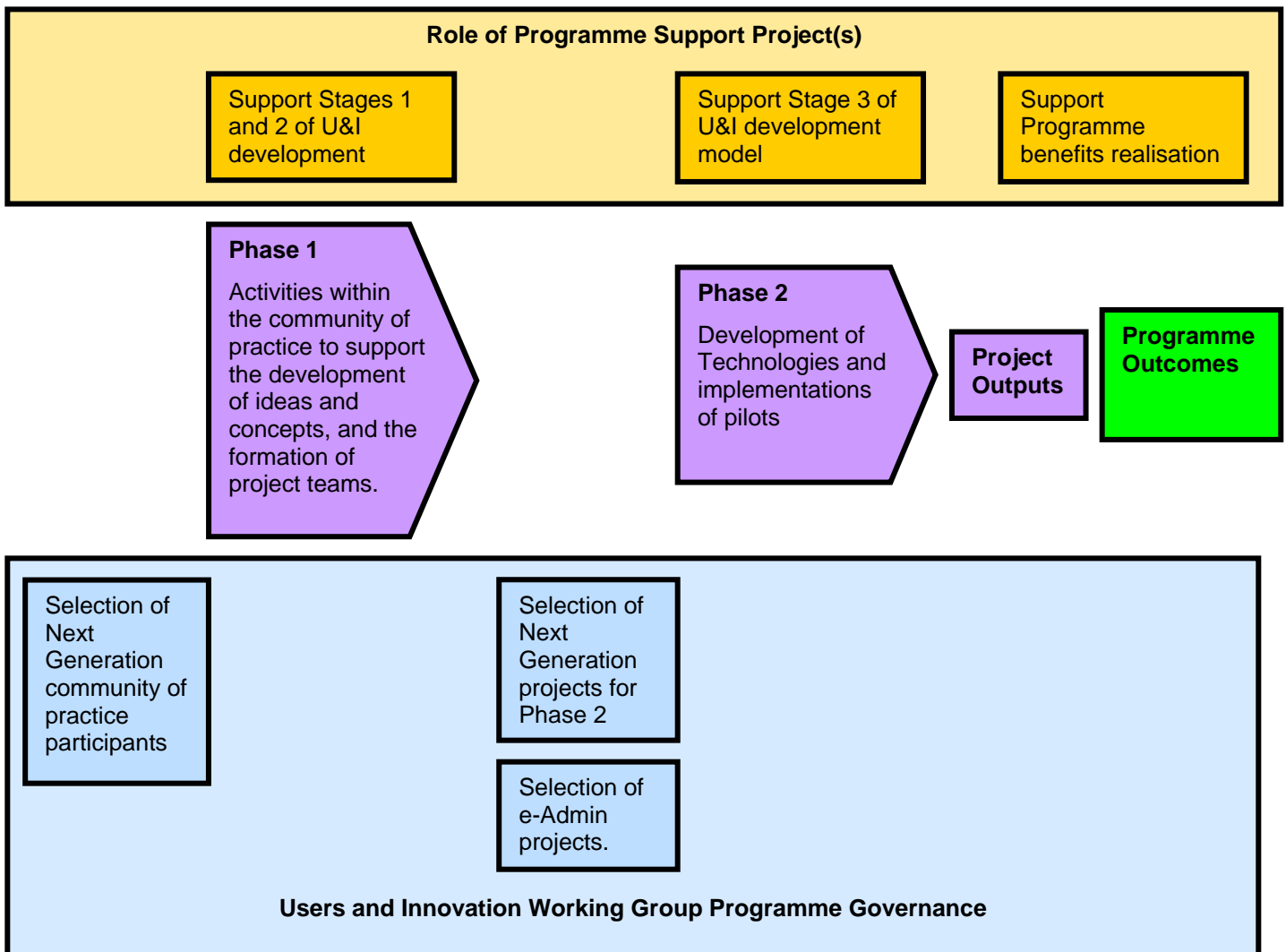
- A9. Phase 1 is a six-month facilitated exploration of project ideas and paper piloting to surface and validate real user needs, identify technology gaps, develop implementation project bids, and form associations and consortia. This will be delivered through a community of practice and support

² <http://www.jisc.ac.uk/cs/blogs/ui/>

projects, producing the deliverables outlined in Table 1). It is envisaged that bids will be invited for Phase 2 in August 2007, and projects will commence in October 2007 and end by March 2009 at the latest. Evaluation of bids will be set against criteria aligned to the Users and Innovation development model. All bids will be expected to demonstrate evidence against activities outlined in Table 1.

- A10. Figure 2, below, details the stages of the Next Generation strand. The Personal e-Administration is considered to represent a more mature problem space and hence projects funded under this strand will, in effect, "jump in" at the start of Phase 2. NB: Personal e-Administration projects will only be funded in this way if their proposals are able to evidence satisfactory completion of activities equivalent in nature and deliverable to Stages 1 and 2 of the model. JISC reserves the right to invite bidders under the Personal e-Administration strand to join the Next Generation strand community of practice with their project idea (if appropriate) if the idea is interesting and *potentially* fundable under that strand, but they have been unable to demonstrate thorough early-stage model activity (particularly user engagement and validation).

Figure 2: Users and Innovation Development Model Phases and Transition



	December 2006	March 2007	September 2007	October 2007
Phase 1		Next Generation community of practice activity commences		
Gateway	Personal e-Administration selection of projects		Next Generation selection of projects	
Phase 2		Personal e-Administration projects commence		Next Generation projects commence

Table 2: Timetable for Phased Activities

Phase 1

A11. This phase facilitates the development of a community of practice (consisting of individuals and/or teams from institutions).to engage in early stage development activity. Expressions of interest for participation are invited from bidders who can provide:

- expert knowledge about problem spaces;
- innovative ideas on how to apply next generation technologies and practice; and/or
- institutional settings, test users and support resources that can be made available in order to demonstrate technological solutions in context.

A12. Phase 1 will involve community of practice individuals / teams engaging in activities covering Stages 1 and 2 of the Users and Innovation development model, such as scenario planning, brainstorming, and paper piloting, facilitated by the Users and Innovation Support Project(s).

A13. Personal e-Administration bidders, given the more mature nature of the area, can commence at Stage 3, although bidders are strongly encouraged to supply evidence to demonstrate that they have successfully completed the activities outlined under Stages 1 and 2 of the Users and Innovation development model, and are able to supply equivalent deliverables.

Phase 2

A14. During this phase, both the Next Generation and the personal e-Administration strands of the programme will be engaged in the development and implementation of technologies and practices as described in their proposals.

Further Cycles of the Model

A15. Figure 3 shows the development model over three cycles, providing varying degrees of user and stakeholder engagement, and extending over varying timeframes, according to the level of support and funding available:

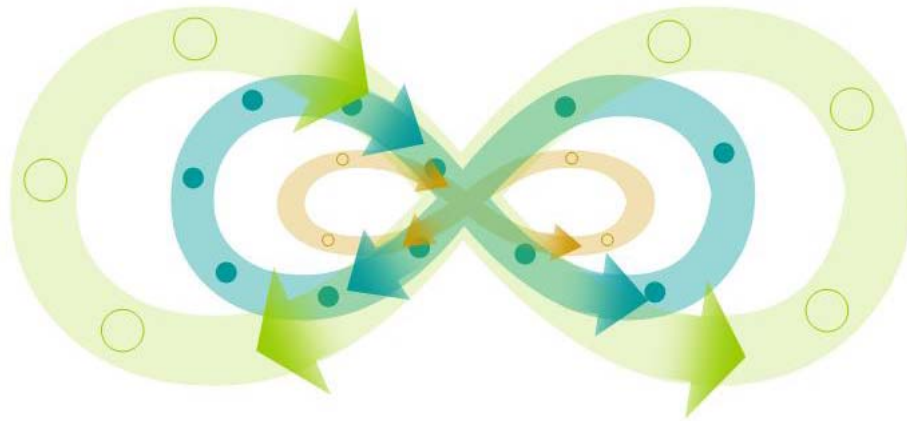


Figure 3: Development Model Cycles

The inner cycle (brown)

A16. This represents the development cycle that an institution’s small development team may typically undertake without access to a wider community to assist them in their user engagement and validation activities.. It reflects limited time and resource availability for the development of technology and its implementation in practice. There may also be limited iterations of the cycle, for example, a learning technology or practice may be piloted on a single module at one stage which may not be repeated until the following year.

The middle cycle (blue)

A17. This represents the Users and Innovation programme supported cycle of development. Here more time and resources are allocated and expertise can be drawn from the community of practice and through the Users and Innovation support project(s). This funded cycle should cover a wider range of richer engagement activities (as demoted by the circles within the ‘figure-of-eight’ loops, mapping onto the activities in Table 1 above.

The outer cycle (green)

A18. This represents the interaction that should occur in addition to the User and Innovation programme. Here relationships may be formed and strengthened with interested parties representing industry, international partners and other wider stakeholders that may benefit from the outputs of the development process.