HEDIIP NSCS Project -
Adoption Plan

About the New Subject Coding Scheme Project

The New Subject Coding Scheme Project was commissioned by HEDIIP under the Standards and Understanding theme. The project aimed to develop a replacement for the Joint Academic Coding Scheme that met the needs of a broad group of stakeholders and reflected the diverse and dynamic nature of Higher Education in the twenty-first century. The New Subject Coding Scheme project was undertaken by the Centre for Educational Technology, Interoperability and Standards (Cetis) with partners APS Ltd and Aspire Ltd. The project undertook extensive stakeholder engagement to identify the requirements for the new coding system and developed a coding structure that aims to meet these requirements. The new coding scheme is referred to as HECoS – the Higher Education Classification of Subjects.

The project ran from May 2014 to October 2015.

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About HEDIIP

The Higher Education Data & Information Improvement Programme (HEDIIP) has been established to redesign the information landscape in order to arrive at a new system that reduces the burden on data providers and improves the quality, timeliness and accessibility of data and information about HE.

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About This Report

A report on the development of the Higher Education Classification of Subjects vocabulary, with an account of feedback on it by stakeholders, and how the feedback has been used.

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Contents

1. Executive Summary

Although classification of the subject of courses of study is, in some ways, a small component in the Higher Education data and information landscape, the breadth of use of subject coding is enormous. Use of subject codes from the time a course is first advertised to prospective students, through to analysis on the working of the Higher Education system and provider benchmarking means that a change in the approach to classification of subject of study will require the coordination of a large number of stakeholders including: HE Providers, league table publishers, UCAS, HESA, funding councils, and Professional Statutory and Regulatory Bodies.

HECoS (Higher Education Classification of Subject) is a new vocabulary built from JACS3, which it succeeds, with unused terms removed, classification aids added, and focussed on clearly distinguishable subjects. Stakeholder consultation revealed broad support for a decisive approach to change, with a feeling that a concerted move-over from JACS3 to HECoS is likely to be the best approach. Although this will require the marshalling of stakeholders and resource into a shorter period of time, it would more quickly open the doors to systemic benefits and would avoid the costs arising from incompatibilities due to partial adoption. Consequently, the approach envisaged in this report is for adoption to proceed according to the following three recommendations:

Recommendation 1
The formal adoption of HECoS and its transition to the recommended governance model should be pursued as a matter of urgency.

Recommendation 2
HECoS adoption should be overseen by the HE Data Governance Body, as envisaged in *The Blueprint for a New HE Data Landscape* (KPMG, 2015).

Recommendation 3
Concerted Deployment is recommended, in which full adoption of HECoS across all relevant data activities is implemented in a single academic year.

A specific timetable for change to HECoS is not proposed in this report – this should be a matter for the HE Data Governance Body and its consensus process – but the likely roll-out of changes to data collection as part of the HESA Data Futures Programme suggests that the earliest date for HECoS to be in active use would be the 2018-2019 academic year.

An orderly approach to adoption will be essential, with key decisions made in a timely manner and clearly communicated, an adequate period for affected stakeholders to plan for change, and a clear and concerted transitional period. Affected stakeholders include those who originate data, those who process it, those who rely on statistics derived from the data, and those who design and build the IT systems which underpin the creation of, and interaction with, the data. Information resources that address the range of stakeholder needs, and are supported by managed central support, will be vital. These should be available in a stable and refined form sufficiently early to inform the planning of change. This report proposes a number of specific tasks to support such an orderly approach (summarised in section 1.2, below).

Finding the best path for adoption and, critically, to the realisation of benefits for a process of change as complex as migration to HECoS is not a trivial undertaking. Consequently, this report recommends that a two-track approach to benefits review should accompany the adoption plan. This includes both a review of benefits realised, and issues identified, once HECoS has become established with a more prospective approach which investigates how stakeholders are engaging with the adoption process as it is underway.

1.2   Summary of Adoption Tasks

The following list of tasks, which are presented in the order they appear in the document, rather than time-order, summarises the activities which have been identified by stakeholders in the consultation process and by the NSCS Project team.

Task 1 is concerned with dependency and course data lifecycle.

Adoption Task 1: Review subject code assignment workflow
Undertake a short review of the workflow around UCAS' assignment of subject codes to determine the extent of dependency and implications for revision to accommodate the Concerted Deployment option (Section 6).

Tasks 2-4 are concerned with Subject Based Analysis, which is detailed in a separate NSCS Project deliverable (*Recommendations for Subject Based Analysis & Text Mining*, Cooper, 2015).

Adoption Task 2: Defined Standard Cross-sector Aggregation Rules
As described in PD05 proposals starting 'SA', and section 3.3.

Adoption Task 3: Develop associations of HECoS to ATAS and QAA Benchmark Statements
As described in PD05 proposals starting 'ATAS' and 'QAA', and section 3.3.

Adoption Task 4: Knowledge transfer, technical documentation and guidelines on a standardised approach to aggregation rules
Recommendations for Subject Based Analysis & Text Mining, (Cooper, 2015), section 3.3 proposes that a consistent approach to publishing commonly used aggregation schemes, which are not formally part of HECoS (for example HECFE SIVS), in a standardised form for use across the sector. This task should ensure that the approach used for the Standard Cross-sector Aggregation Rules is well documented, and explicit, and that appropriate knowledge is transferred to the appropriate part of the HE Data Governance Body.

Tasks 5 and 6 are concerned with establishing the central service for HECoS.

Adoption Task 5: Hand-over of HECoS to HESA (knowledge transfer and implementation support)
While *The Higher Education Coding of Subjects (HECOS) vocabulary* (Kraan and Paull, 2015) and *Governance Model* (Campbell and Ferrell, 2015) lay out aspects of the design of HECoS and its delivery via a web service, additional work will be required to translate these to a working and staffed service. Some aspects of this task will be transient knowledge-transfer from the NSCS Project team to responsible staff in HESA, which may be best handled as an 'on-demand' support activity, whereas other aspects more naturally lend themselves to documented outputs. In the latter case, we recommend collaboration. The aim of this task is to maximise access to implicit knowledge and to minimise false-steps arising from unfamiliarity with the design of HECoS.

Adoption Task 6: Establish HECoS services within HESA
This task is a place-holder for an internally-facing set-up project within HESA, which has already been identified as the host for HECoS. The NSCS Project has identified the following tasks, which are outlined in the *Governance Model* (Campbell and Ferrell, 2015):

- Analyse the impact of setting up HECoS within HESA (p. 21).
- License and publish the coding scheme (pp. 17 - 18).
- Establish staffing, hosting arrangements and maintenance procedures for HECoS web service (p. 22).
- Procure and instantiate a space for online information resources (see section 9.1, below)
- Procure a system and infrastructure to deliver the HECoS web service (pp. 18 - 20).

In addition to technical system-testing, this task should also involve low-stakes process testing, which should involve at least two HEPs following a complete process from acquiring HECoS (as data), using draft guidance materials (section 10), coding a representative sample of non-live data, and communicating it to another party to interpret.

Tasks 7-12 are concerned with awareness-raising communications and communication channels.

Adoption Task 7: Develop a well-articulated communication plan
Develop a communication plan which is focussed on HECoS but also joined-up with wider HE data and information improvement initiatives and with the communication activities of individual Core Sector Bodies so that clear and consistent messages are received by affected stakeholders and that the other tasks in section 10.1 (this section) are well-aligned.

Adoption Task 8: Raise awareness in, and seek engagement from, press and digital media
Ensure that the news media and providers of information about higher education are aware of the change, have accurate information about how HECoS has been developed, and understand how adoption will proceed. It should actively engage with league table providers to support them in accurate use of HECoS-derived data and to promote alignment around common structures, so far as this is possible in relation to their desire for distinctiveness.

Adoption Task 9: Communications pack for HE Providers
Create a range of resources for use in HEPs which should be available online and in document formats that make both distribution and re-use/adaption easy. There should be both concise summaries, for example following the 'frequently asked questions' format, and more extended information, which should be tailored for particular key roles. Where possible, references (by persistent URL) to the location of the latest definitive source of detailed information, as maintained by the HE Data Governance Body, should be included.

Adoption Task 10: PSRB briefing
Develop a concise briefing that outlines the change and the likely impact on PSRB collection of course-related data from HEPs, as well as identifying potential benefits that could be realised along-side the migration from JACS3 to HECoS.

Adoption Task 11: Establish and oversee ad hoc communication channels
Establish open community channels and a direct support channel, with active participation and monitoring from the central team.

Adoption Task 12: Establish HECoS Champions
Identify HECoS Champions, define the relationship between Champions and the HE Data Governance Body, establish a contact list and communication channels.

Tasks 13-17 are concerned with the creation of information resources and with training.

Adoption Task 13: Create operational information resources
Create information resources that have long-term relevance, covering both transition and operational phases of HECoS. Outputs should include document formats that can be easily distributed, reused and re-purposed into internal guidance and training materials.

Adoption Task 14: Migration resources
This task is concerned with the resources which would be valuable in the transitional period (Phase C) but which would diminish in value during operations and for which there would be little value in ongoing maintenance. This task would involve scoping the requirements for a web-based migration tool, identifying the systems it will be required to interoperate with, and choosing the technology to be used.

Adoption Task 15: Create and maintain an implementation planning template/checklist

Create an online implementation plan template for HEPs that identifies likely points of impact, the potential for additional benefits, and which cross-references other information resources. The implementation plan template should be updated as issues are identified during HECoS adoption.

Adoption Task 16: HECoS Champions' training workshop
Design and deliver face-to-face opportunities for designated HECoS Champions (see Section 10.2). These should build on the information resources outlined in Section 11.1 and include ample opportunity for question and answer sessions, in addition to working through realistic examples. The number of workshops should meet demand, but it may be necessary to limit participation to a single champion per organisation.

Adoption Task 17: Engagement workshops for software and BI developers, data warehouse specialists, etc.
Design and deliver workshops for relevant technical developers to ensure they understand HECoS, how it differs from JACS3, and the ways in which the data formats being provided can be used to provide a good user experience in the transitional period and in the long-term operation. The workshops should also engage key staff with influence over product development plans in order to maximise the embedding of user-friendly HECoS support. The number of workshops should meet demand.

Tasks 18 and 19 are concerned with benefits review.

Adoption Task 18: Prospective benefits review
Structured review of attitudes and communications relating to adoption of HECoS and the drafting of an action plan for the HE Governance Body to consider.

Adoption Task 19: Retrospective adoption review
Specification of objective performance measures, undertake an assessment against these measures, research the causes of high and low performance, capture lessons learned, recommend remedial actions to address core operational issues (if required), and identify opportunities for improved benefit realisation.

2. Overview

The New Subject Coding Scheme Project[1] (hereafter 'NSCS Project') was commissioned by HEDIIP under the Standards and Understanding theme. The project aimed to develop a replacement for the Joint Academic Coding Scheme that meets the needs of a broad group of stakeholders and reflected the diverse and dynamic nature of Higher Education in the twenty-first century. The NSCS Project was undertaken by the Centre for Educational Technology, Interoperability and Standards (Cetis) with partners APS Ltd and Aspire Ltd. The project undertook extensive stakeholder engagement to identify the requirements for the new coding scheme and developed a coding structure that aims to meet these requirements. The new coding scheme is referred to as HECoS – the Higher Education Classification of Subjects.

HECoS is a new vocabulary built from JACS3, which it succeeds, with unused terms removed, classification aids added, and focussed on clearly distinguishable subjects. HECoS, and the procedure adopted for its creation, is described in NSCS Project deliverable *Higher Education Classification of Subjects (HECoS)* (Kraan and Paull, 2015). Unlike JACS3, HECoS is designed to work with many hierarchies by separating terms from the way they are aggregated. This separation allows HECoS to fulfil more diverse functions in a coherent and structured way, but it also means that one widely agreed analytical hierarchy is essential to maintain comparability of analyses. This is the subject of a separate report *Recommendations for Subject Based Analysis & Text Mining* (Cooper, 2015).

In general there appears to be enthusiasm for the new approach and for using HECoS to deliver benefits at the earliest realistic opportunity. So far, the difficulties in pinning down the adoption timeline in detail arise from dependencies on core sector body change projects, rather than reconciling any tensions in different stakeholder views about adopting HECoS itself.

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[1] The New Subject Coding Scheme Project, http://www.hediip.ac.uk/subject_coding/

There remain a number of decisions to be taken, not least about developments outwith the scope of this project, before a definitive timescale can be proposed. Hence, this report avoids giving a specific timetable for full adoption, given continued uncertainty about sector body change programmes (e.g. HESA Data Futures Programme), preferring to leave this to be determined by the consensual body which will be formed to govern the HE data and information landscape. This report does, however, look at stakeholder views and what is currently known about prerequisites and dependencies. It outlines a managed approach to adoption in terms of phases of adoption, objectives, and specific tasks.

This report is organised as follows:

1. By way of introduction and orientation, we follow this overview with an outline of the approach taken to develop the adoption plan.
2. A high level phased adoption model is outlined, along with five principal objectives for adoption.
3. Stakeholder views, prerequisites, and dependencies are discussed to arrive at a preferred approach to adoption.
4. Requirements for an effective adoption are discussed and a series of tasks described. Task descriptions are referenced to in the discussion, phased adoption model, and principal objectives.

3.   Approach to Developing the Plan

The *New Subject Coding Scheme Impact Assessment and Requirements Definition* report (Kraan and Paull, 2014) that marked the final output from Stage 1 of the NSCS Project identified a number of requirements relating to guidance and training that are addressed in this adoption plan. Aside from highlighting the importance of education and training generally, the requirements are not prescriptive and do not determine the overall shape of the adoption plan; they are listed in Appendix 1 for reference, and are not discussed further here.

During Stage 2, the Stage 1 interview transcripts and workshop outputs were reanalysed to collate more detailed data. In addition, a number of workshops were held to enable stakeholders, representatives of the advisory panel and Higher Education Providers (hereafter, 'HEPs') to provide detailed input on various aspects of the development and implementation of HECoS, including governance and adoption. See Appendix 2 for further details of the Stage 2 workshops and a list of stakeholders consulted.

In order to gather input on the adoption plan from across the sector, the NSCS Project employed a number of different approaches to elicitation and consultation in Stage 2:

● Adoption and Governance Workshop held on 23 January 2015 with representatives from the HEDIIP Advisory Panel and HE Providers (Appendix 2).
● Core Sector Body Questionnaire (Appendix 3).
● Workshops as part of regular sector events.
● HEDIIP vendor meeting (30 January 2015) - a joint HEDIIP/UCISA event in Cheltenham aimed at suppliers of
● systems to HE institutions.
● Interview with HESA/UCAS (23 January 2015).
● Public consultation, from February to May 2015, on the first draft of this report, which was based on a synthesis of input obtained from the previous five bullet-pointed activities.
    o A public consultation website[2] was established to disseminate drafts of the coding scheme, the governance model and the adoption plan, to gather comment, and to solicit responses by email.
    o During this public consultation period, a HEP Self-assessment Questionnaire (Appendix 4) was made available. Nine HEPs participated.
    o A webinar was delivered and activities at sector events were also undertaken to raise awareness, explain HECoS, and to stimulate engagement in the consultation exercise[3].

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[2] HECoS Public Consultation site, https://subjectcoding.wordpress.com/.
[3] The project team received thirty-one email responses and numerous comments and questions during a webinar organised in association with Jisc, and attended by around one hundred participants. A classification exercise designed to test the

The public consultation exercise stimulated detailed organisational responses via email or separate documents from many sector bodies and HEPs, covering all aspects of HECoS on the consultation website. Specific points relating to the Adoption Plan were made by 4 sector bodies and 18 HEPs. The key points raised during the consultation are summarised in Appendix 5.

4. Managed Adoption and Outline Timescale

The transition timescale is very simple in essence. The great majority of stakeholders consulted agreed that, as long as a fully populated scheme with associated web service and training resources was available at the beginning of a particular calendar year, then implementation in the autumn of that same year, i.e. for the start of the academic year, would be possible. The tightest deadline for HE Providers on the critical path was identified as the Initial Teacher Training in-year return due in mid-October. There was no suggestion that implementation by HE Providers at any time other than the start of an academic year would be feasible so any change to the transition timescale will be in terms of whole years. (The possible move to in-year HESA returns may however change this perspective.)

Feedback from stakeholders during the workshop with Advisory Panel members and HE Providers in January 2015 (Appendix 2) indicated that they were positive and optimistic about the transition timescales. Some stakeholders suggested that HECoS could be in active use as early as October 2016, though this was based on decoupling an assumed dependency on UCAS (see 8.2 below). This timescale is not, however, recommended in this report. Feedback on the need for a longer lead time articulated during the consultation workshop focused on delivering maximum benefit to the sector. Workshop participants saw this as a considerable opportunity to re-engage academics and encourage them to better understand the purposes of subject coding and to improve data quality; there was general consensus that the form of HECoS reduces opportunities for 'game-playing'. Some institutions indicated that they would wish to instigate a full internal review of their approach to subject coding, however if the lead time did not permit this they would simply do a straightforward mapping and 'deal with the consequences afterwards'.

4.1 Phases of Adoption

An orderly process of adoption can be envisaged as a series of phases, with successful completion of each phase giving stakeholders the confidence to proceed to the next one. We propose the following phases (summarised in Figure 1) and milestones as a useful way of organising the adoption process, and we refer to them in the discussion which follows, and in the specification of adoption tasks.

Phase A is concerned with HECoS being formally adopted for use in the HE data and information landscape; Milestone 1 (MS1) is the point at which this occurs and HECoS comes under the aegis of the governance body outlined in *HEDIIP NSCS Project Governance Model* (Campbell and Ferrell, 2015). It is not necessary for the full range of prerequisites for HECoS adoption to be in place by MS1; its primary purpose is to give adopters confidence to move to the next stage by laying the first solid foundation stone.

Phase B allows for HE Providers (HEPs), Core Sector Bodies, and software suppliers to undertake local impact analysis and change planning (including identification of opportunities for enhancement and additional benefits realisation). The HEP Self-assessment Questionnaire indicates the need for more information to be provided to HEPs before this can take place (see Appendices 5 and 7 for the questionnaire and a summary of responses). An important aim for NSCS Stage 3 should be to alert stakeholders of the impending change such that they appreciate the need to plan, and to provide resources to support Phase B. This matter is dealt with in Section 9, below. Phase B represents an opportunity for a first assessment of likely sector-wide benefits and impact, with possible interventions indicated to increase the benefits. Phase B has diffuse starting and ending points.

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coding scheme was conducted during the Student Records Officer Conference (SROC) 2015 in York, with a group of over forty participants, and at the UCAS 2015 Admissions Conference in Newport with a group of around twenty participants. All three events allowed participants to provide feedback and comments on the draft Adoption Plan.

Phase C commences with Milestone 2 (MS2), confirmation of the date when HECoS is to be used for inter-organisational exchanges in the HE data and information landscape. All supportive resources, web services, etc., should be present by MS2. Furthermore, PD05, the *NSCS Project report on Subject Based Analysis* (Cooper, 2015) outlined the need for further technical work on aggregation schemes for statistical work; an agreed scheme is a pre-requisite for MS2. Quarter three of 2016 would be a reasonable target for MS2. During Phase C, HECoS should start to be in operational use in HEPs, having begun at the start of an academic year (see early remarks in this section).

Phase D commences with Milestone 3 (MS3), the first high stakes data exchange utilising HECoS. This represents the first step in the inter-organisational adoption of HECoS, hence in Phase D, HECoS becomes fully operational.
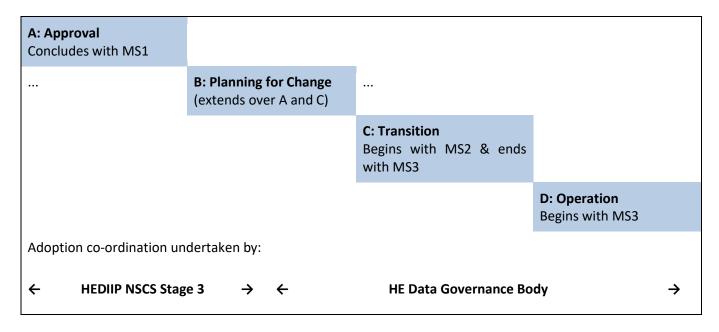
A: Approval Concludes with MS1			
...	**B: Planning for Change** (extends over A and C)	...	
		C: Transition Begins with MS2 & ends with MS3	
			D: Operation Begins with MS3
Adoption co-ordination undertaken by:			
← **HEDIIP NSCS Stage 3** →	← **HE Data Governance Body**		→

Figure 1 – Schematic of Adoption Phases

The adoption process will be supported by both the New Subject Coding Scheme (NSCS) Project Stage 3[4] and the HE Data Governance Body[5]. It is expected that there will be a period during Phase B, when both will be engaged in complementary activities, with the latter being the de-facto client for work undertaken in Stage 3. In this report, when we outline adoption tasks, a provisional identification of the NSCS Project or the Governance Body is made, but this is necessarily contingent on budget allocation.

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[4] Stage 3 is described in the *HEDIIP Programme Plan to July 2015* (p. 22) as follows: 'Stage 3 will be required to develop a detailed plan to communicate and launch HECoS. Training materials and courses will need to be designed and delivered to ensure that the coding scheme is consistently and widely applied. The project will need to develop the training materials and work with HESA to provide the training either online and/or in training sessions. Training will need to consider the needs of different audiences who may have diverse perspectives on subject coding such as planners, registrars and academic staff The project will also need to produce the open licence and coding support tool and transition these to the Governance Body. The project will need to co-ordinate the launch of the new system and drive take up. At the end of the project support and governance for the new system must be transitioned to the Governance Body business as usual.'

[5] *The Blueprint for a New HE Data Landscape* (KPMG, 2015) provides an illustrative approach to implementing effective governance of the data and information landscape. In order to harmonise the recommendations of this report with the recommendations of the *Blueprint*, the same terminology has been adopted for the different tiers of governance. The roles and functions of these governance entities is outlined in Section 6.2.1 Data Governance in the New Landscape of *The Blueprint* (KPMG, pp. 51-52) and in the recommendations outlined PD06 *HEDIIP NSCS Project Governance Model* (Campbell and Ferrell, 2015). However, it is acknowledged that in instantiating the recommended governance structures, these functional governance roles may be delivered by existing teams within HESA.

Recommendation 1 Milestone 1, the formal adoption of HECoS and its transition to the recommended governance model, should be pursued as a matter of urgency. A target of quarter one 2016 is suggested, however MS1 should be timed to dovetail with the establishment of the wider HE data landscape governance structures and the Standard Dataset (*The Blueprint for a New HE Data Landscape*, KPMG, 2015).

4.2 Principal Objectives

A number of principal objectives for an effective adoption process have been identified, through consultation and by reference to the wider HEDIIP. The adoption process should:

1. Actively spread information about the change from JACS to HECoS, to alert stakeholders to the need to plan and to raise awareness of the enhancement opportunities that the change affords.
2. Ensure that stakeholders are provided, in a timely manner, with resources and communication opportunities which will facilitate planning for, and implementation of, change.
3. Ensure that education, training, and supporting resources are created to support the proper operational use of HECoS, or which will be instrumental in easing the transition from JACS3 to HECoS, in sufficient time to allow the appropriate staff to absorb the content.
4. Put in place central facilities, encompassing processes and supporting ICT as outlined in the *Governance Model* (Campbell and Ferrell, 2015).
5. Include reflection on the process of adoption while it is occurring as a means to identify actions to promote greater benefits.

5. The Context of HECoS Adoption

During the public consultation on HECoS, another HEDIIP project was considering the governance of the wider HE data and information landscape, culminating in the publication of *The Blueprint for a New HE Data Landscape* (KPMG, 2015), hereafter '*The Blueprint*', which recommends:

> '*the Governance Body, termed the HE Data Governance Body, will not report to any other body or group in the sector in order to be independent, but will be physically based at HESA.*' (KPMG, p. 10)

As HECoS will directly support the creation of the Standard Dataset, it is anticipated that both HECoS and the new HE Standard Dataset will be governed by the HE Data Governance Body as outlined in *The Blueprint*. The *Governance Model* (Campbell and Ferrell, 2015) explains a model for HECoS governance within the HE Data Governance Body and, correspondingly, this report is written with a presumption that this body would oversee adoption of HECoS. This presumption is grounded on two observations: adoption is much more likely to be successful when overseen by an authoritative body, even more so when it has the capacity to intervene; the public consultation on HECoS showed strong support for an independent entity within HESA, as envisaged in *The Blueprint*. The presumption is also informed by history; the current status of the ULN (unique learner number) in HE is perhaps an example where salutary lessons can be learned. The Learning Records Service (LRS) provides an effective service for the day-to-day management of the ULN but has had neither the resource nor the mandate to ensure the adoption of the ULN across the HE sector with the consequence that awareness and take-up is low. In order to ensure that HECoS is adopted efficiently and effectively across the sector and to ensure that the full benefits of the new coding scheme are realised, it is essential that the HECoS adoption plan is adequately planned, supported and financed and that it carries the necessary mandate.

Recommendation 2 HECoS adoption should be overseen by the HE Data Governance Body, as envisaged in *The Blueprint for a New HE Data Landscape* (KPMG, 2015).

6. Deployment Options

Three stereotype deployment options emerged and were discussed during the consultation. These are outlined below, along with the principal considerations for or against each option.

Staged Deployment

The starting point for scoping the adoption plan was to assume that all stakeholders would adopt HECoS beginning from the earliest point in the course-related data lifecycle, allowing it to ripple smoothly through the various stages of data generation and use, following students as they progress. This assumption would put UCAS in pole position in terms of being the first sector body to hold new subject codes for course information. The logic of this assumption was explored in the Adoption and Governance Workshop (see Appendix 2, and discussed further in section 7.2 on dependencies) and deemed to be flawed. There was strong feeling, not least from HE Providers, that there are clear benefits to be gained from the new scheme and that these should be realised sooner rather than later. Consequently there was little support for a protracted adoption timescale.

Parallel Running

During the early phases of the adoption consultation there was considerable discussion about the potential need for 'parallel running' of JACS 3.0 and HECoS. A number of stakeholders identified this as an essential requirement while others were equally firm in their view that this would impose an additional unnecessary burden.

Some HEPs (currently a small minority) have expressed the view that they may end up running some kind of JACS/HECoS comparison 'virtually indefinitely' due to the extent to which they have embedded JACS in their internal systems. This has led a number of HE Provider representatives to question the wisdom of how their institutions have implemented JACS within their systems. Some HEPs have also suggested that it may not be necessary to unpick all these implementations in order to adopt HECoS.

The governance and adoption workshop offered an opportunity to explore in more detail exactly what different parties meant by use of the term parallel running. It transpired that this requirement arose almost entirely from a desire to ensure the integrity of time series analyses of statistical data and, furthermore, that mapping to JACS 3.0 (and in some cases earlier versions of JACS) was adequate for this purpose. Consequently, the NSCS Project team has defined the requirement for synchronised adoption (which may include some form of parallel running over one academic cycle) in terms of preservation of time series integrity, which is dealt with in *Recommendations for Subject Based Analysis & Text Mining* (Cooper, 2015).

Concerted Deployment

This option can be regarded as an accelerated form of Staged Deployment, which breaks the assumption of aligning HECoS adoption with the start of the data lifecycle. As the discussion above on Staged Deployment shows, the adoption consultation process indicated strongly that there was little appetite for delaying deployment of HECoS in order to align adoption with the data lifecycle. Concerted Deployment would enable full adoption of HECoS during a single academic year across all relevant data activities and students at all stages of progression. This will reduce the potential for confusion and inconsistent implementation that might result from a more protracted change over.

In this scenario, it is not necessary to synchronise adoption to UCAS-related data exchanges for courses that will be offered in the future; HESA and other data returns on active courses may be the first time HECoS is used in a high-stakes situation. The Student Record data exchange may be a good starting point since HESA operates good quality assurance measures and historical data for continuing students may provide a relatively easy way of monitoring the transition process, which will provide HEPs with additional re-assurance. (It may be useful to augment this QA process, or to modify the timetable, on a one-off basis, to comprise de-facto pre-launch testing.) In addition, if the HE Data Governance body is located within HESA, as recommended in *The Blueprint*, this will help to facilitate effective monitoring and QA of the adoption process.

Recommendation 3 Concerted Deployment is recommended, in which full adoption of HECoS across all relevant data activities is implemented in a single academic year.

7. Dependencies

In addition to considering HEP adoption requirements, which comprise the bulk of the subsequent sections of this report, three significant areas of dependency will determine the timeline for adoption of HECoS, in particular the dates for MS2 and MS3 as outlined in Section 4.

7.1 HESA Data Futures Programme

HESA is in the process of initiating a large scale Data Futures Programme that aims to transform their data collection processes in order to 'achieve relevant, more timely data, using systems that are technically future-proofed, flexible and that interface with information management systems across the sector' (*The Blueprint for a New HE Data Landscape*, KPMG, 2015, p.5). This initiative will develop a business case, which will act as a gateway to major investment in future phases of a transformation programme.

HESA will be consulting the HE sector on the specifics of the Data Futures Programme during quarter three of 2015; the dependencies between the Programme and HECoS will only become clear following this consultation.
Subject to a clear and positive outcome, plans are expected to be ready for action from late quarter one of 2016. This would probably place roll-out of the first tranche of the Data Futures Programme, which is expected to focus initially on the student record, into the 2018-2019 academic year.

While the transition to the new HE data and information landscape envisaged by HEDIIP, of which HECoS is a component, should clearly be aligned to the Data Futures Programme, it is important that HECoS has its own clearly articulated governance and adoption plans. These plans must take account of processes and system changes that are beyond the scope of Data Futures Programme, which include analysis of HECoS-coded data, and uses of HECoS outwith HESA data collection.

7.2 UCAS & UCAS Transformation Programme

During consultation workshop discussions several HEPs indicated that they see UCAS' commitment to HECoS adoption as an important component in realising the benefits of the HE data and information landscape. However UCAS is in the early stages of a major ecosystem transformation and as yet no plans or timelines have been finalised. Given the absence of a timetable, it would be wise not to attempt to dove-tail HECoS adoption with UCAS system transformation; UCAS will have to move on a timetable which realises efficiencies from synchronised change elsewhere in the system.

As discussed in Section 6, Concerted Deployment need not begin with the assignment of a HECoS code at the start of the UCAS-related workflow, thus enabling adoption of the new subject coding scheme to proceed with greater agility. However the Concerted Deployment option presumes that HECoS codes would begin to be applied by UCAS on the creation of new courses during the same annual cycle as elsewhere in the system. This presumption was challenged by a number of participants during stakeholder workshops, who contended that better quality, more meaningful data may be created by discontinuing the current approach whereby UCAS allocates JACS codes upon the creation of a new course. Often the course in question may still be subject to approval and insufficient detail is available to assign the most appropriate JACS code; this may result in a different JACS code ultimately being returned to HESA. The subject code is not currently used in practice until applications can be submitted and the advertising process can operate without it.

As there may be a value in revising existing processes while HECoS is being adopted, it would be useful to review the workflow around UCAS' assignment of subject codes to assess feasibility and impact of a changed approach. The central question is: when in the course data lifecycle is it best to assign a HECoS code, and how can the workflow

be engineered to maximise consistency? In addition, there is a secondary question regarding how this relates to the timetable for adoption of HECoS. Despite the undoubted importance of UCAS' commitment to HECoS adoption, the stakeholder consultation workshops suggested that the sector can cope with UCAS being 'out of synch' for a certain period of time. From UCAS' perspective, it seems likely that some form of 'retro-fitting' of HECoS codes (i.e. retrospective UCAS implementation of HECoS) may be necessary, but this requires further investigation. Although this approach would suggest an element of parallel operation that is somewhat at odds with the recommendation of Concerted Deployment made in Section 6, it may represent the best pragmatic solution for HECoS adoption. A review of subject code assignment workflow should help to further clarify this matter.

Adoption Task 1: Review subject code assignment workflow			
Description:	Undertake a short review of the workflow around UCAS' assignment of subject codes to determine the extent of dependency and implications for revision to accommodate the Concerted Deployment option (Section 6).		
Outputs:	1. Current workflow model and narrative. 2. Analysis of impact, mitigations, and required changes.	**Benefits:**	1. Better-informed roll-out. 2. Reduced risk of burden-some data manipulation.
Phase:	A or B.	**Delivered by:**	Stage 3.
Objective:	2 and 5.		

7.3 Impact of Migration to HECoS within HESA Analytical Services

The HESA Data Futures Programme is a pragmatic dependency in as much as it will necessarily require a significant change to systems and processes in the data collection pipeline; consequently it provides an opportunity for avoiding the cost of a separate HECoS-specific migration. There is, however, a dependency within HESA downstream from data collection.

Setting up and operating HECoS within HESA will represent a significant task, as JACS is embedded in approximately 80-90% of HESA systems and used to generate in the region of 1000 data reports per annum. In order to develop a realistic plan for the adoption of HECoS within HESA it will be necessary to undertake a thorough analysis of the impact of adopting the new coding scheme which may be estimated to take in the region of 3 months. Until this analysis has been undertaken it is difficult to ascertain the time and effort that will be required to implement HECoS across all relevant HESA systems, however given the level of technical debt and dependency on JACS, this is likely to represent a significant task.

8. HECoS Subject Based Analysis

The NSCS Project has reported separately on subject based analysis in *Recommendations for Subject Based Analysis & Text Mining* (Cooper, 2015). This deliverable is concerned with clarifying the scope of work and the process by which subject based analysis could be improved along-side the migration from JACS3 to HECoS. To be clear: there remains some technical and consensus-based work to be undertaken before HECoS can replace JACS3. Hence, completion of the following tasks, which are outlined in in PD05, is a key dependency for HECoS adoption.

Adoption task 2 should precede MS2, whereas the other tasks can be completed in the early part of Phase C (see Section 4.1). Suggestions made in PD05 which relate to text mining are not on the HECoS adoption path and so do not figure in this report. PD05 also refers to league table providers, which are covered in Section 10 of this report.

Adoption Task 2: Defined Standard Cross-sector Aggregation Rules			
Description:	As described in PD05 proposals starting 'SA', and section 3.3.		
Outputs:	1. Aggregation rules (documented and machine-readable). 2. Apportionment rules (documented).	**Benefits:**	Consistent statistics (see PD05).
Phase: Objective:	A (initial drafting) and B. Core pre-requisite and objective 2.	**Delivered by:**	Stage 3 (initial drafting). HE Data Governance Body (consensus).

Adoption Task 3: Develop associations of HECoS to ATAS and QAA Benchmark Statements			
Description:	As described in PD05 proposals starting 'ATAS' and 'QAA', and section 3.3.		
Outputs:	1. HECoS to ATAS association. 2. HECoS to QAA benchmark statement mapping.	**Benefits:**	Avoidance of duplicate working and burden of dual scheme operation (see PD05).
Phase: Objective:	A and B (possibly into early Phase C). Core pre-requisite and objective 2.	**Delivered by:**	Stage 3.

Adoption Task 4: Knowledge transfer, technical documentation and guidelines on a standardised approach to aggregation rules			
Description:	PD05 (section 3.3) proposes that a consistent approach to publishing commonly used aggregation schemes, which are not formally part of HECoS (for example HECFE SIVS), in a standardised form for use across the sector. This task should ensure that the approach used for the Standard Cross-sector Aggregation Rules is well documented, and explicit, and that appropriate knowledge is transferred to the appropriate part of the HE Data Governance Body.		
Outputs:	1. Technical documentation and guidelines on the standard aggregation rules description approach.	**Benefits:**	1. Enables efficient application of core sector aggregation frameworks. 2. Reduced errors and improved quality of derived data (especially in HEPs).
Phase: Objective:	B. 3 and 4.	**Delivered by:**	Stage 3.

9. HECoS Service Availability

The main prerequisite for all stakeholders is that the fully populated scheme is available as a supported web service, governed by an appropriate governance body, and supported by associated training and communication materials. The NSCS Project has produced *The Higher Education Coding of Subjects (HECOS) vocabulary* (Kraan and Paull, 2015) in both machine-readable and human-readable digital formats, as documents and via vocabulary management software[6]. These digital resources provide a specification and benchmark against which candidate tools for long-term use can be selected.

Governance Model (Campbell and Ferrell, 2015) makes recommendations on the HECoS governing body, change management processes, governance of subject group definitions, governing specialist vocabularies, licensing, the HECoS web service, monitoring, and set up and operating costs. (The page references in tasks 5 and 6 refer to the Governance Model report.)

Adoption Task 5: Hand-over of HECoS to HESA (knowledge transfer and implementation support)			
Description:	While NSCS Project deliverables *The Higher Education Coding of Subjects (HECOS) vocabulary* (Kraan and Paull, 2015) and *Governance Model* (Campbell and Ferrell, 2015) lay out aspects of the design of HECoS and its delivery via a web service, additional work will be required to translate these to a working and staffed service. Some aspects of this task will be transient knowledge-transfer from the NSCS Project team to responsible staff in HESA, which may be best handled as an 'on-demand' support activity, whereas other aspects more naturally lend themselves to documented outputs. In the latter case, we recommend collaboration. The aim of this task is to maximise access to implicit knowledge and to minimise false-steps arising from unfamiliarity with the design of HECoS.		
Outputs:	1. Translate web service requirements to a specification fit for a procurement process. 2. Elaborate the procedures and criteria for change control.	**Benefits:**	Implicit knowledge of the NSCS Project team is accessed in an efficient and timely manner.
Phase: **Objective:**	B and into C. 4.	**Delivered by:**	Stage 3[7] and HESA.

Adoption Task 6: Establish HECoS services within HESA			
Description:	This task is a place-holder for an internally-facing set-up project within HESA, which has already been identified as the host for HECoS. The NSCS Project has identified the following tasks, which are outlined in the *Governance Model*: - Analyse the impact of setting up HECoS within HESA (p. 21). - License and publish the coding scheme (pp. 17 - 18). - Establish staffing, hosting arrangements and maintenance procedures for HECoS web service (p. 22). - Procure and instantiate a space for online information resources (see section 9.1, below). - Procure a system and infrastructure to deliver the HECoS web service (pp. 18 - 20). In addition to technical system-testing, this task should also involve low-stakes process testing, which should involve at least two HEPs following a complete process from acquiring HECoS (as data), using draft guidance materials (section 10), coding a representative sample of non-live data, and communicating it to another party to interpret.		
Outputs:	1. Public facing website. 2. Public web services.	**Benefits:**	[core pre-requisite]
Phase: **Objective:**	B. 4.	**Delivered by:**	HESA.

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[6] HECoS, http://www.ovod.net/tematres/vocab/

[7] Or existing NSCS Project team members if Stage 3 is awarded to another contractor.

9.1. An Authoritative Persistent Information Source

The following sections outline the requirements for various forms of communication to promote and support adoption. It will be important to deliver these resources to stakeholders in such a way to ensure that they are authoritative, trustworthy and discoverable. Consequently, consideration should be given to the web site that will ultimately host these resources. It is recommended that the HECoS communications website should have the following characteristics:

1. All resources must have a stable and persistent URL which should remain unchanged in the long term in order to ensure that links remain unbroken; broken links undermine the credibility of both the organisation and the content and may lead to important resources being lost.
2. All resources should include a readable persistent URL for both the specific version they appear in, and for the latest version, in order to ensure that the current authoritative version can always be located.
3. HECoS resources should be published to an internet domain associated with the governing body of the HE data and information landscape, and should be similarly branded, so that both URLs and resources are recognised as being authoritative.
4. There should be one single source; other bodies should be firmly discouraged from hosting copies or publishing derivative versions.
5. Search engine optimisation techniques should be employed to ensure that resources are easily discoverable. This should include ensuring that core sector body web sites link to HECoS resources.

10. Awareness-raising Communications and Community Support

10.1. Awareness-raising

The fact that subject coding is changing and the implications of those changes needs to be communicated to a wide range of stakeholders some of whom may be outside the HE sector, e.g. press, vendors, etc. A purposeful communications plan, which is focussed on HECoS but also joined-up with wider HE data initiatives and the communication activities of individual Core Sector Bodies, will be an important instrument. In addition, it should not be assumed that all relevant stakeholders in the HE sector are already aware of the changes envisaged by HEDIIP. PSRBs are a particular stakeholder group which may only be peripherally-aware of HEDIIP and there are likely to be stakeholders in HEPs for whom early awareness-raising will help to avoid the transition being rushed, or for whom awareness may trigger actions that will increase the benefits of change (i.e. HEPs may be stimulated to undertake more comprehensive revision of coding workflows than minimal-effort migration to comply with external requirements).

The need for clear and accessible briefings and informative resources from an authoritative source has been highlighted as an important factor in effective communications to different audiences and stakeholder groups. Four stereotypical audiences have been identified, along with the type of communication resources that should be tailored to these groups.

● Press releases and general briefings about the changes and their implications suitable for use by the press and digital media providers. The consultation process identified league table producers in particular as an important part of the course data landscape for whom tailored resources should be produced. See *Recommendations for Subject Based Analysis & Text Mining (*Cooper, 2015) for further details. Press releases and general briefings will educate people in the media industry and stimulate news items which raise awareness more widely.

- Communications pack for use by HEP champions and others, to address:
  - o Business support staff in planning, quality, admissions, marketing, etc. These should have a strong emphasis on the benefits of HECoS and the things institutions can do with the available data from a strategic and business support perspective.
  - o Academic staff. These should focus on particular disciplines where there has been significant change, as well as the practicalities of adopting HECoS. Consultation participants suggested this might also include short podcasts or videos from academic peers.
- Briefings specifically aimed at PSRBs to explain the changes and to encourage them to monitor the communication channels, or engage (Section 10.2) and to plan-ahead.

Feedback from stakeholders suggests that appropriate 'badging' of each of the communication resources will be an important factor in establishing their credibility with different audiences. Therefore those preparing the communication materials should collaborate with core sector bodies and HE professional bodies to ensure that HECoS briefings and resources meet the requirements of these organisations and have their visible backing.

Adoption Task 7: Develop a well-articulated communication plan			
Description:	Develop a communication plan which is focussed on HECoS but also joined-up with wider HE data and information improvement initiatives and with the communication activities of individual Core Sector Bodies so that clear and consistent messages are received by affected stakeholders and that the other tasks in section 10.1 (this section) are well-aligned.		
Outputs:	1. Communication Plan document.	**Benefits:**	Affected stakeholders act in a timely and efficient manner.
Phase: **Objective:**	Late Phase A. 1.	**Delivered by:**	HEDIIP, then the HE Data Governance Body.

Adoption Task 8: Raise awareness in, and seek engagement from, press and digital media			
Description:	Ensure that the news media and providers of information about higher education are aware of the change, have accurate information about how HECoS has been developed, and understand how adoption will proceed. It should actively engage with league table providers to support them in accurate use of HECoS-derived data and to promote alignment around common structures, so far as this is possible in relation to their desire for distinctiveness.		
Outputs:	1. Press releases. 2. Direct contact with league table providers.	**Benefits:**	1. The change to HECoS is more widely disseminated via the media. 2. League tables/CUG make correct use of HECoS-derived data.
Phase: **Objective:**	From MS1 into Phase C. 1 and 2.	**Delivered by:**	HE Data Governance Body.

Adoption Task 9: Communications pack for HE Providers			
Description:	Create a range of resources for use in HEPs which should be available online and in document formats that make both distribution and re-use/adaption easy. There should be both concise summaries, for example following the 'frequently asked questions' format, and more extended information, which should be tailored for particular key roles. Where possible, references (by persistent URL) to the location of the latest definitive source of detailed information, as maintained by the HE Data Governance Body, should be included.		
Outputs:	1. Information pack online and in re-usable and distributable document formats.	**Benefits:**	1. Reduction in overall effort and in delay of information spread by relying on HEPs to create internal communications. 2. Increased access to accurate and up-to-date information.
Phase: **Objective:**	A, refreshed in Phase B. 1.	**Delivered by:**	Stage 3, revised/supplemented by HE Data Governance Body.

Adoption Task 10: PSRB briefing			
Description:	Develop a concise briefing that outlines the change and the likely impact on PSRB collection of course-related data from HEPs, as well as identifying potential benefits that could be realised along-side the migration from JACS3 to HECoS.		
Outputs:	1. Concise briefing online and in an easily-distributable document format.	**Benefits:**	1. PSRBs not caught by surprise, minimising risk of de-facto dual use of JACS3 and HECoS in HEPs. 2. Opportunities to align use of specialist vocabularies with HECoS are realised.
Phase: A. **Objective:** 1.		**Delivered by:**	Stage 3.

10.2. Supporting a Community

Personal and social interactions are likely to play an important part in an effective and efficient adoption process. Consultation with stakeholders identified the following as potential vehicles, to which further rationale has been added.

Community forum

Fora, whether web-based (e.g. Google groups) or email-based (e.g. JiscMail) are an effective channel for community engagement and support. In order to be effective, balance needs to be sought in which peer-to-peer interactions are complemented by moderation and intervention. Peer interactions are a valuable source of authentic and contextualised knowledge, while moderation and intervention ensures that questions do not go un-answered, misconceptions are not propagated, and obstacles to adoption can be quickly identified and actions taken by the HE Data Governance Body.

Centralised helpline

While care must be taken to manage support and communication expectations to ensure they do not become excessive in terms of cost and resource, it would be beneficial to provide a centralised helpline to assist adopters and help to provide feedback to the HE Data Governance Body on adoption progress. Provided an effective approach to logging enquiries is established, this would allow corrective action to be taken promptly. An email, rather than telephone, helpline may be delivered more efficiently, and in order to control the resource implications, a limited time-window during Phase B of adoption may be sensible.

HECoS Champions

A list of HECoS Champions or 'super users' in each institution (not exclusively HEPs) could be maintained and published as part of the central information resource. These individuals would be identified as the local contact point, as well being as activists and champions. This approach would enable enquiries to be directed to the local champion as the first point of contact. As with the community forum, this would help to avoid calling on limited central resource while providing the benefit of access to locally-contextualised information. Champions could also have privileged 'red phone' access to experts in the HE Data Governance Body. Liaison with champions would provide vital intelligence about the progress of the adoption process. A dedicated forum for HECoS champions may also be a useful facility.

Adoption Task 11: Establish and oversee ad hoc communication channels			
Description:	Establish open community channels and a direct support channel, with active participation and monitoring from the central team.		
Outputs:	1. Actively managed support channels.	**Benefits:**	1. Knowledge transfer and problem resolution among adopters that is timely and scalable.
Phase: **Objective:**	B. 2, 5.	**Delivered by:**	HE Data Governance Body.

Adoption Task 12: Establish HECoS Champions			
Description:	Identify HECoS Champions, define the relationship between Champions and the HE Data Governance Body, establish a contact list and communication channels.		
Outputs:	1. Identify HECoS Champions 2. Create private contact list of Champions. 3. Communication channels established.	**Benefits:**	1. Increased rate of information transfer. 2. Reduced load on central resource.
Phase: **Objective:**	B. 1, 2.	**Delivered by:**	Stage 3, maintained by HE Data Governance Body.

11. Education and Training Needs

Responses to the consultation identified the provision of appropriate education and training materials as vital to ensuring a 'fresh start' to implementing HECoS in a way that significantly improves data quality and does not run the risk of replicating past errors. The online vocabulary management software (TemaTres) used in the NSCS Project Stage 2 consultation exercise was positively received, with stakeholders noting that the interface provides a user-friendly way of exploring the scheme, and that features such as scope notes represent a considerable improvement on the information currently available with JACS, to aid understanding of the appropriate use of terms. It is not assumed that the same software will be used in the long term, neither is it assumed that software developers will not replicate the same kind of approach in their own software, but it is clear that implementing something similar to TemaTres would make use of HECoS relatively straight-forward.

Although routine use of HECoS is expected to be unproblematic, it will be important to ensure that a number of differences between HECoS and JACS3 are clearly communicated and widely understood (for further details, refer to *The Higher Education Coding of Subjects (HECOS) vocabulary*, Kraan and Paull, 2015). The key points of difference are:

1. HECoS is a non-hierarchical scheme, i.e. a 'flat list'.
2. The structure of HECoS is intended for navigation only to help users find the correct term, and not for coding or aggregation.
3. A common aggregation scheme will be separately defined. This is referred to as the 'Standard Cross-sector Statistical Aggregation Rules' in *Recommendations for Subject Based Analysis & Text Mining*, (Cooper, p. 9).
4. The approach taken in some subject areas, e.g. history, is quite different to JACS.

In addition to support materials pertaining to HECoS (and the associated Standard Cross-sector Statistical Aggregation Rules), centrally-provided support focussed on change management can reduce the cost and improve the quality and benefits of adoption. This idea has been supported in the NSCS Project consultation process. An implementation plan checklist or template would avoid the need for every HE provider to 'reinvent the wheel' at the start of their own planning process. Although the response rate to the HEP self-assessment questionnaire was quite low, the responses received uphold the idea that support for planning and implementing change will be useful (see Appendix 6 for a summary of questionnaire responses). A template of this kind should be regarded as a prompt to ensure all key issues are discussed, as the circumstances of implementation will be different in each location. It is also likely to catalyse peer-to-peer exchanges in the online forum, and it may be appropriate to realise change-

planning support as a collection of 'living resources', which can be revised as experience is gained and surfaced via the forum. The support materials should also prompt HEPs to explore opportunities for realising a wider range of benefits and synergies.

11.1. Information Resources

The Higher Education Coding of Subjects (HECOS) vocabulary (Kraan and Paull, 2015) describes the design of HECoS in detail, however additional information resources will be required to support adoption. These information resources should to be clear, concise, user-friendly and readily accessible from the authoritative HECoS website. They should be structured and presented in a way which allows for them to be used without support; introductory materials should not be burdened by jargon or complexity, while more advanced materials should not labour over elementary points. Worked examples should be included. The following resources have been identified for inclusion in the knowledge base during the consultation process, although some line items might sensibly be combined:

1. A high level introduction, for example '10 things everyone should know about HECoS' or answers to Frequently Asked Questions (FAQ). See Section 10, above.
2. A general-purpose guide for users of HECoS and the Standard Cross-sector Statistical Aggregation Rules.
3. Information on how HECoS should and should not be used, including information for policymakers.
4. Information on the governance arrangements and how to engage with the HECoS change process (e.g. the registry of proposed new terms).
5. Technical briefings for IT system suppliers (including in-house developers within HE Provider institutions), including essential background to the machine-readable formats being provided.
6. Technical guidance for data analysts.
7. A migration manual, comprising:
   a. A simple re-coding guide that explains to users what to do with a course that has an existing JACS3 code. This should clearly indicate whether there is a 1:1 relationship, where there are new codes available which might be a better choice, and where a fresh assessment of the appropriate code will be required.
   b. A detailed and definitive guide to the relationship between HECoS terms and legacy JACS3 terms.
8. A simple web-based tool with a basic API that, given an existing JACS term, presents a list of HECoS codes and notes on application or offers a 'predictive text' facility. This could be a locally-run, rather than centrally-hosted, tool intended purely for quick and easy incorporation into existing IT systems. As such, it could be designed purely for use by software developers and have no visual presentation.
9. An implementation plan checklist/template, with appropriate cross-references to other information resources, both specific to HECoS and pertaining to the wider landscape.

Section 9.1 outlines some principles which apply to all information resources.

Adoption Task 13: Create operational information resources			
Description:	Create information resources that have long-term relevance, covering both transition and operational phases of HECoS. Outputs should include document formats that can be easily distributed, reused and re-purposed into internal guidance and training materials.		
Outputs:	As outlined in items 2-6 above.	**Benefits:**	1. Accurate and efficient use of HECoS.
Phase:	A and into the earlier part of phase B.	**Delivered by:**	Stage 3 (maintained by the HE Data Governance Body).
Objective:	3.		

Adoption Task 14: Migration resources			
Description:	This task is concerned with the resources which would be valuable in the transitional period (Phase C) but which would diminish in value during operations and for which there would be little value in ongoing maintenance. This task would involve scoping the requirements for a web-based migration tool, identifying the systems it will be required to interoperate with, and choosing the technology to be used.		
Outputs:	1. Migration manual (item 7 above). 2. Web-oriented tool (item 8 above).	**Benefits:**	1. Reduced effort and increased accuracy during migration.
Phase: **Objective:**	B. 2.	**Delivered by:**	Stage 3.

Adoption Task 15: Create and maintain an implementation planning template/checklist			
Description:	Create an online implementation plan template for HEPs that identifies likely points of impact, the potential for additional benefits, and which cross-references other information resources. The implementation plan template should be updated as issues are identified during HECoS adoption.		
Outputs:	1. A 'living' template/checklist (item 9 above).	**Benefits:**	1. Reduced adoption effort for organisations. 2. Additional opportunities identified.
Phase: **Objective:**	B. 2.	**Delivered by:**	Stage 3, maintained by the HE Data Governance Body.

11.2. Training and Workshops

While it is unrealistic to expect everyone who is required to learn about HECoS to do so simply by reading information resources, the proposition that face-to-face training solves this problem may be challenged on two levels:

1. Face-to-face activities do not scale up easily without requiring human resource which are unlikely to be available for adoption support.
2. The organisational structures and business processes in place in relevant stakeholder bodies are, broadly speaking, idiosyncratic. There is likely to be a strong element of contextualisation required to move from abstract HECoS guidance to 'what to do in practice'.

Face-to-face education and training activities should, therefore, focus on stakeholders who are pivotal, either because their actions have a significant knock-on effect, or because they are well-placed to cascade knowledge within their own organisation (e.g. HECoS Champions). The approach to creating information resources outlined in Adoption Task 12, specifically bearing in mind the potential for re-purposing and re-use, should aid this cascade effect.

Software developers (in house and commercial), including business intelligence, analytics developers and data warehouse specialists, may be an important group to target as well-constructed software that exploits the power of HECoS will lead to better coding and data handling with reduced effort. Technical developers may also have a preference for practical rather than document-centric approaches to knowledge acquisition, and a workshop designed to service that preference could be highly effective.

It is conceivable that engagement with software suppliers and in-house developers could obviate the need for certain kinds of training. Subject to suppliers being willing, and presuming that they are supplied with appropriate knowledge and that HECoS is available in a suitable data format, it is conceivable that using HECoS becomes a natural part of data processing which is either broadly-intuitive or supported by software-specific induction and training.

Adoption Task 16: HECoS Champions' training workshop			
Description:	Design and deliver face-to-face opportunities for designated HECoS Champions (see Section 10.2). These should build on the information resources outlined in Section 11.1 and include ample opportunity for question and answer sessions, in addition to working through realistic examples. The number of workshops should meet demand, but it may be necessary to limit participation to a single champion per organisation.		
Outputs:	1. Event collateral. 2. Champions equipped for their role.	**Benefits:**	Champions are well-equipped to cascade knowledge in their organisations and know what facilities and resources are available to them.
Phase: **Objective:**	B. 3.	**Delivered by:**	Stage 3, extending to HE Data Governance Body as required.

Adoption Task 17: Engagement workshops for software and BI developers, data warehouse specialists, etc.			
Description:	Design and deliver workshops for relevant technical developers to ensure they understand HECoS, how it differs from JACS3, and the ways in which the data formats being provided can be used to provide a good user experience in the transitional period and in the long-term operation. The workshops should also engage key staff with influence over product development plans in order to maximise the embedding of user-friendly HECoS support. The number of workshops should meet demand.		
Outputs:	1. Developer-friendly guidance and examples. 2. Knowledgeable technical staff. 3. Well-aligned product development plans.	**Benefits:**	Software which supports accurate and efficient use of HECoS, and which exploits its features and the availability of the web service.
Phase: **Objective:**	B, continuing into C as required. 3.	**Delivered by:**	Stage 3, extending to HE Data Governance Body as required.

12. Benefits Review Plan

There is a need to ensure that the HECoS implementation delivers the expected benefits and, to this end, some form of benefits review process is necessary. A formative/diagnostic review process is valuable to guide progress towards benefits, as opposed to a purely post-hoc evaluation, but some aspects can only be evaluated once use has bedded in. Consequently, a two-track approach to benefits review may be useful, taking both a prospective and retrospective view of adoption.

Prospective Adoption Review attempts to understand how stakeholders are planning to adopt HECoS so that the overseer of the adoption process can intervene to promote actions that will increase benefits. These actions will attempt to encourage stakeholders to progress beyond taking a minimal compliance focused approach to adoption, to one which is: a) decisive as opposed to laggardly; b) enables them to appreciate and accommodate the full scope of adopting the new coding scheme; c) provides opportunities for non-essential, but synergistic and benefit-laden changes to be identified and exploited.

Prospective adoption review would naturally fall into Phase B of the adoption model (Section 4) and would rely on a structured qualitative review of questions and opinions raised through mailing lists, online fora, and sector events, together with data from helpline logs. The review could usefully identify positive stories and case studies, as well as suggesting practical issues for inclusion in revisions to the resources referred to in Section 11. Publication of key findings would be desirable in the interests of transparency.

Retrospective Adoption Review is concerned with actual adoption and linking it to benefits, which may be either relatively localised or systemic. This kind of review is likely to be important both for understanding how to better manage the adoption and operation of HECoS, as well as potentially myth-busting concerns about cost and benefits. To counter the risk of possible group-think the retrospective adoption review process should be undertaken by an

external supplier in order to ensure it is independent, transparent, and credible. This review should re-measure initial measurements undertaken by the HEDIIP Programme Management Office to baseline the benefits. It should consider the following topics, which would need to be expressed in objective form as part of the review:

- Has there been an improvement in data quality? Has simplistic re-coding caused or propagated coding errors?
- How many Professional, Statutory and Regulatory Bodies have adopted HECoS?
- Has HECoS improved the re-usability of data, between systems within organisations, as well as between organisations?
- Is HECoS demonstrably inadequate in any subject areas? This might be judged on the basis of the number and distribution of accepted requests for new terms. Review of requests for new terms to be added to HECoS, as one indicator of fitness for purpose.
- Are groups from outside HE, e.g. employers, media, etc., making use of HECoS?
- To what extent is derived data, i.e. published and private statistics, more easily compared or combined?
- Has continuity of time-series data been maintained to an acceptable level?
- To what extent has provision of HECoS in machine-readable formats, and the provision of APIs, supported the creation of more usable software?

The timing of such a review must balance the desirability of gaining knowledge at the earliest opportunity, so that corrective action may be taken to increase benefit realisation, with the increase in clarity that would result from a longer review period. The earliest point at which adoption of the new coding scheme could be effectively reviewed is likely to be after the second student record collection which employs HECoS, and following publication of official statistics based on data using HECoS.

Adoption Task 18: Prospective benefits review			
Description:	Structured review of attitudes and communications relating to adoption of HECoS and the drafting of an action plan for the HE Governance Body to consider.		
Outputs:	1. A draft action plan.	**Benefits:**	1. The adoption process is steered towards increased benefit realisation.
Phase: **Objective:**	B. 5.	**Delivered by:**	Ideally an organisation separate from the HE Data Governance Body and from the existing NSCS Project contractor.

Adoption Task 19: Retrospective adoption review			
Description:	Specification of objective performance measures, undertake an assessment against these measures, research the causes of high and low performance, capture lessons learned, recommend remedial actions to address core operational issues (if required), and identify opportunities for improved benefit realisation.		
Outputs:	1. A report documenting methodology, findings, and recommendations.	**Benefits:**	Timely and proactive management of HECoS is enabled. Lessons are learned for down-stream HE data and information landscape changes.
Phase: **Objective:**	D.	**Delivered by:**	Ideally an organisation separate from the HE Data Governance Body and from the existing NSCS Project contractor.

13. References

Campbell, L.M. and Ferrell, G., (2015). *HEDIIP NSCS Project Governance Model.* (NSCS Project Deliverable PD06)

Cooper, A., (2015). *Recommendations for Subject Based Analysis & Text Mining*. (NSCS Project Deliverable PD05)

HEDIIP, *New Landscape Project*. Retrieved from http://www.hediip.ac.uk/new-landscape/

KPMG, (2015). *The Blueprint for a New HE Data Landscape.*

Kraan, W. G. and Paull, A., (2014). *New Subject Coding Scheme; Impact Assessment and Requirements Definition*. (NSCS Project Deliverable PD01/02)

Kraan, W.G., and Paull, A., (2015). *The Higher Education Coding of Subjects (HECoS) vocabulary*. (NSCS Project Deliverable PD04)

Appendix 1 - Requirements for Adoption Plan

Taken from *Impact Assessment and Requirements Definition*, (Kraan and Paull, 2014).

ID	Title	Description
R10	Providing guidance on coding for specific purposes.	The NSCS shall include guidance on how codes are to be allocated with reference to specific purposes. Methods may be different for different purposes.
R11	Providing training recommendations.	The NSCS documentation shall include recommendations for training in how to use the scheme.
R31	Describing guidance purposes clearly.	NSCS guidance shall clearly describe the purposes for which it is designed to be used. It will also cover similar areas for which it is not designed to be used.
R43	Providing support documents.	The NSCS shall have supported documents, such as guidance manuals, subject coding manual, context-sensitive help, scope notes within terms.

Appendix 2 - Adoption and Governance Consultation

Workshops

- NSCS Technical Workshop, HESA, Cheltenham, 11th November 2014.
- NSCS Technical Workshop, University of Loughborough, 11th December 2014.
- From concept to reality; governance and adoption of the HECoS new subject coding scheme, HESA, Cheltenham, 23rd January 2015; workshop for sector bodies and HEPs.
- New Subject Coding Scheme (HECoS) Consultation Workshop: JACS fell down and broke his crown but what will come tumbling after?, SROC 2016, Loughborough University, 4th - 6th April 2015.
- Subject Matters! A look at HECoS, the proposed new Higher Education Classification of Subjects to replace JACS, UCAS Admissions Conference, Celtic Manor Resort, Newport, 30th March 2015.

Webinars

- About the HEDIIP Subject Coding Project, JISC webinar, 23rd April 2015.

Sector Body Responses to HECoS Adoption Questionnaire Spreadsheet

- HEFCE
- SFC
- UCAS
- HESA
- SAAS
- HEFCW

HEp Responses to HECoS Adoption Questionnaire Spreadsheet

- Imperial College London
- Kingston University
- Northumbria University
- University of Cambridge
- University of Greenwich
- University of Hull
- University of Manchester
- University of Portsmouth
- University of Salford

Sector Bodies Individual Responses Relating to Adoption Plan

- Health Education England
- HESA
- HESPA
- UCAS

HEPs Individual Responses Relating to Adoption Plan

- Aberdeen University
- City University London
- Edinburgh Napier University
- Leeds Trinity University
- Loughborough University
- Northumbria University Newcastle
- Plymouth University
- Queen Margaret University
- Sheffield Hallam University
- Swansea University
- University of Greenwich
- University of London, St Georges
- University of St Andrews
- University of Southampton
- University of Sussex
- University of West London
- University of Warwick
- University of Wolverhampton

Stakeholder Consultation: Sector Bodies

- DELNI
- Enterprise Educators UK
- HEE
- HEFCE
- HEFCW
- HESA
- HESPA
- MRC
- NCTL
- QAA
- SAAS / Scottish Government
- SFA
- SLC
- SROC
- UCAS
- UHR

Stakeholder Consultation: Higher Education Providers

- Aberdeen University
- Aberystwyth University
- Anglia Ruskin University
- Aston University
- Bangor University
- Brunel University

- Canterbury Christ Church University
- Cardiff University
- City University London
- Conservatoire for Dance and Drama
- Coventry University
- Edge Hill University
- Edinburgh Napier University
- Harper Adams University
- Imperial College London
- Kings College London
- Kingston University
- Lancaster University
- Leeds Trinity University
- Liverpool Hope University
- London School of Economics
- London South Bank University
- Loughborough University
- Manchester Metropolitan University
- Newcastle University
- Northumbria University Newcastle
- Nottingham Trent University
- Plymouth University
- Queen Margaret University
- Royal Holloway
- Sheffield Hallam University
- Swansea University
- University of Birmingham
- University of Brighton
- University of Bristol
- University of Buckingham
- University of Central Lancashire
- University of Chester
- University of Derby
- University of East Anglia
- University of Edinburgh
- University of Exeter
- University of Gloucestershire
- University of Greenwich
- University of Huddersfield
- University of Hull
- University of Kent
- University of Leeds
- University of London, Goldsmiths
- University of London, Queen Mary
- University of London, St Georges
- University of Manchester
- University of Northampton

- University of Oxford
- University of Portsmouth
- University of Salford
- University of Sheffield
- University of Southampton
- University of St Andrews
- University of Sunderland
- University of Surrey
- University of Sussex
- University of the West of England
- University of Wales Trinity Saint David
- University of Warwick
- University of West London
- University of West Scotland
- University of Wolverhampton
- University of Worcester
- University of York

Stakeholder Consultation: Others

- Health Education England

For a full list of stakeholders consulted during Stage 1 of the New Subject Coding Scheme Project, see Appendix 1 of *Impact Assessment and Requirements Definition*, (Kraan and Paull, 2014).

Appendix 3 - Core Sector Body Questionnaire

An adoption planning questionnaire was sent to the 10 core sector bodies identified as key stakeholders by the PMO and 6 of these returned the questionnaire in time to inform discussions at the governance and adoption workshop. A meeting was held with HESA and UCAS representatives to discuss the responses and create the initial timeline that was later revised during the workshop.

As end users of the data, the main issues for those core sector bodies who currently use JACS is the mapping and explanation required to make sense of time series statistical analyses. These issues are explored in detail in PD05 *Recommendations for Subject Based Analysis & Text Mining* (Cooper, 2015).

The Questionnaire

Each question was provided with a drop-down list for ease of answering, and there was an opportunity for less structured responses at the end.

Name
Organisation

1. How many of your separately identifiable business processes (or systems) currently use JACS codes?
2. Do you have any immediate plans to implement JACS in processes or systems that do not currently use this information?
3. Is the development and maintenance of the IT systems that currently use JACS managed in-house or by a third-party supplier?
4. Are there particular times of the year when you undertake analysis or processing of JACS data?
5. Do any of your current systems rely on the hierarchy built into JACS?
6. Do any of your current analyses rely on the hierarchy built into JACS?
7. Do you undertake any kind of data transformation using JACS that is not already covered by your responses above?
8. Do you pass JACS data on to any partner organisations that may not have been represented in the HEDIIP programme consultations?
9. Do you have any system upgrades planned that may have an impact on HECoS adoption?
10. Do you have any planned system replacements that may have an impact on HECoS adoption?
11. Are you aware of any other factors such as organisational restructuring/mergers that may have an impact on HECoS adoption?
12. How would you rate the resource requirements for the modifications necessary to ensure your current systems are able to store HECoS?
13. How would you rate the resource requirements for the business process changes necessary to implement HECoS?
14. Do you anticipate any resource requirements for one-off changes necessary to implement HECoS e.g. recoding of existing data?
15. Do you envisage that any staff will require training in relation to HECoS adoption? (If so, please state what type of staff and how many.)
16. What is the minimum period of time your organisation will require in order to make the necessary adjustments to adopt HECoS?
17. Based on the above, what is the earliest academic year your organisation would be ready to accept HECoS from Higher Education providers and when would you start using this data?
18. Would you prefer a change over period when JACS 3 and HECoS are used in parallel?
19. Would you like to see HECoS mapped to any other classifications in addition to JACS 3?

20. Do you envisage requiring any support in auditing/verifying the information you produce during the early stages of HECoS adoption?

21. Do you envisage requiring any support in communicating with the wider user base e.g. explaining differences between legacy datasets and HECoS outputs?

22. Any other comments?

Appendix 4 - HEP Self-assessment Questions

Each question was provided with a drop-down list for ease of answering, and there was an opportunity for less structured responses at the end.

Name
Job Title
Institution

People and Resources

1.1   Have you identified how the HECoS implementation will be managed and who will be responsible?
   Yes
   Partially
   Not Yet

1.2   Have you identified all of your stakeholders involved in HECoS implementation?
   Yes
   Partially
   Not yet

1.3   Are you in a position to estimate time and resource requirements for HECoS implementation?
   Yes fairly confidently
   Still some uncertainties
   No - very uncertain

1.4   Are you in a position to identify which staff will need training/updating in order to use HECoS effectively?
   Yes
   Partially
   Not yet

1.5   Do you anticipate any resource requirements for one-off changes necessary to implement HECoS e.g. recoding of existing data?
   No
   Limited resource requirements
   Significant resource requirements

Processes and Information

2.1   Excluding HESA returns and ATAS for how many other separately identifiable business processes do you currently use JACS codes? E.g. managing course information, marketing, resource allocation, internal or external benchmarking etc.
   No
   More than 1-2
   3-4
   4 or more

2.2   How would you describe the accuracy and consistency of subject coding in your institution?
   Accurate and consistent institution-wide
   Likely to vary between departments
   Don't know

2.3   Have you undertaken any recent auditing of the accuracy and consistency of subject codes?
   Yes a thorough audit
   Partial auditing
   No

2.4   Are you planning a review of your approach to subject coding as part of HECoS implementation?
   Yes a full review
   Will target specific areas
   No will just map from JACS 3

2.5   Will you have a need to use HECoS alongside any other classifications (in addition to JACS 3 for which a mapping will be provided)?
       No
       Yes other sector-wide classifications
       Yes in-house classifications

2.5a   If you answered yes to 2.5 please state what other classifications.

2.6   Do any of your analyses use the hierarchy built into JACS?
       No
       Don't Know
       Yes

2.6a   If you answered yes to 2.6 please state what types of analysis.

Information Systems

3.1   Are the processes/systems that currently use JACS digital or paper-based?
       Fully digital
       Mix of digital & paper
       Paper-based

3.2   Do any of your information systems use the JACS code as part of a primary key?
       No
       Don't Know
       Yes

3.3   Is the development and maintenance of the IT systems that currently use JACS managed in-house or by a third-party supplier?
       3rd party
       Mix of 3rd party & in-house
       In-house

3.4   Will you need to amend any system interfaces?
       No
       Don't Know
       Yes

3.5   Do you have any upgrades planned for any of the systems that currently use JACS in the next 2-3 years?
       No
       Possibly
       Yes

3.6   Do you have any plans to replace any of the systems that currently use JACS in the next 2-3 years?
       No
       Possibly
       Yes

If you would like to add any further information about implementation issues please use this space.

Appendix 5 - Synopsis of Public Consultation Responses

This appendix summarises the comments made on the draft of the adoption plan which was made available via the consultation website from February to May 2015.

Information Resources and Training Required

Consultees indicated that training for people allocating codes and for using coded data, including league table providers, will be important to achieve both consistency/accuracy of coding and robust and stable analysis. A knowledge-base was identified as being an essential element, and some consultees emphasised the need for brevity and the avoidance of complexity, and the desirability of differentiation by role. The need for raising awareness, as a precursor to engagement with information resources or training, was also identified. Some consultees pointed to the need for transitional ('mapping') support. Some responses noted that there would be an institutional cost for training staff and providing training materials.

These positions have been accommodated by a combined approach (Section 11) involving information resources and a cascaded approach to training. In addition, software developers have been identified as an important group to educate about HECoS. We have also noted the desirability of resources being easily repurposed by HEPs to support their internal staff training.

Comments made by: HESPA, HESA, Greenwich, Loughborough, St. George's, Northumbria, Simon Walton, Sheffield Hallam, Plymouth and Leeds Trinity.

Adoption Timing and Strategy

HESA urged caution over communicating a timescale for adoption in advance of an actual implementation plan. Consultation indicated clear support for adoption which is synchronised with other changes and which avoids parallel running of JACS3 and HECoS by having a concerted sector-wide switch over, as opposed to piecemeal migration.

Sections 7 and 8 outline these considerations and make recommendations on timing and strategy. Section 4 gives the macro-level view and states that the timing of adoption should be a matter for the HE Data Governance Body.

Comments made by: HESPA, HESA, Aberdeen, UCAS, St Andrews, Leeds Trinity, UEA, Loughborough, Wolverhampton, Napier, Simon Walton, and Warwick.

Costs and Cost-Benefit Analysis/Justification

Many HEPs expressed concern about the cost and there were many comments expressing a view that a cost-benefit analysis should be undertaken, or should already have been undertaken.

A cost-benefit analysis is considered to be outside the scope of this adoption plan. As a general point, the aim of reducing cost has been adopted throughout. For example, opportunities have been identified where duplicated effort can be reduced by centrally-developed resources. It is also proposed that the adoption process gives a clear interval between a formal decision to adopt HECoS and actual adoption, so that organisations can undertake an orderly transition. In addition, an approach to benefits review (Section 12) is taken which is formative - i.e. is intended to guide the adoption process and central support, rather than being a wholly retrospective review - across two dimensions: maximising benefits, and easing adoption.

Comments made by: HESPA, HESA, Aberdeen, Greenwich, Manchester, St George's, Northumbria, Gloucestershire, UCLAN, Aberystwyth, Wolverhampton, Napier, St Andrews, UWL, Reynolds, Salford, Edinburgh, Chester, Worcester, QMU, Sunderland, York, Sussex, Sheffield Hallam, Liverpool Hope, Edge Hill, Warwick, Goldsmiths, Surrey, Plymouth, Leeds Trinity, Oxford, Sunderland, Bangor, and Birmingham.

HECoS Service and HECoS as Data

A small number of consultees identified value in the provision of HECoS in an interoperable machine-readable format and as a web service. Consultees also suggested or implied that software would have an important role to play in making HECoS code selection a quick and reliable process. Suggestions included predictive text, browsing aids using related terms, embeddable widgets, and migration support.

This requirement is indeed an aspect of adoption, however it is addressed primarily in the *Governance Model* (Campbell and Ferrell, 2015). This report focusses on the steps required to set up the HECoS Service (Section 9), rather than detailing requirements. We have, however, noted the value of engaging with software developers and have suggested that a web-based tool to support migration from JACS3 would be valuable. We have not proposed translation to languages other than English, as was suggested by one consultee. HEFCW indicated that it did not anticipate a need to provide a version in Welsh but would undertake that on its own account, if deemed necessary

Comments made by: HESA, Loughborough, Swansea, Sussex, Simon Walton, Chris Gutteridge (Southampton)

Appendix 6 - Summary of Self-Assessment Questionnaire Responses

Only 9 responses were received and these appear to be from HE Providers who are already aware of HECoS and HEDIIP generally, probably have better-than-average levels of data maturity, and consequently are more likely to be ready to undertake change. On the other hand, the questionnaire was completed during consultation on draft versions of HECoS and supporting documents, so respondents lacked details and had no firm implementation timeline as a motivation for certain preparatory tasks. Consequently, the summary given below should be viewed with caution, and the summary itself is given in outline. The responses have informed, rather than dictated, the content of this report.

In relation to people and resources which would need to be mobilised to implement HECoS, responses indicated:

● Only a small minority have identified how their HECoS implementation will be managed and who will be responsible.
● Stakeholders who would be involved in implementation are largely un-mapped.
● HEPs feel they are not in a position to estimate time and resource requirements.
● The majority feel they cannot yet identify which staff will need training/updating.
● The great majority anticipated significant one-off migration costs.

In relation to processes and information involving JACS3/HECoS, responses indicated:

● 4 or more business processes, in addition to HESA returns and ATAS, are likely to be affected in many institutions.
● Respondents are generally confident about their data quality and base this confidence on recent audits.
● There is a fairly even split between three stereotype approaches to migration, identified as 'full review', 'target specific areas, 'just map from JACS3.
● The JACS3 hierarchy is central to analysis.

Concerning information systems, responses indicated that:

● Around half of existing processes are at least partially paper-based.
● JACS3 codes are used as a primary key (identifier) in systems at around half of the respondents' institutions.
● The typical system mix includes both in-house and 3rd party.
● Those respondents who knew expected system interfaces would have to change.
● Only a small minority did not expect planned system upgrade to occur in the next 2-3 years, with system replacement being less likely.