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1. PURPOSE OF TEMPLATE

The purpose of SURF’s Cloud Activities Plan 2012 is to contribute to the development and implementation of cloud policy at the connected institutions. Developing and adopting a Cloud Strategy is a crucial part of this process. The template presented here is intended as a guide for the institutions in drawing up their own Cloud Strategy.

The template is based on the available best practices and literature, specifically:
- SURF’s Sourcing Toolbox¹
- Implementing Strategic Sourcing Best Practice: A Manager’s Guide to World Class Best Practices, Christine V. Bullen, Richard LeFave and Gad J. Selig, Van Hare Publishing

A pre-final version of the template was discussed (23 May 2012) by the CIO Consultation Group (made up of Chief Information Officers), CvDUR (the Coordination Meeting of Directors of University Computer Centres), and COMIT (the ICT directors at universities of applied sciences). That version has therefore been designated as ready for use by the institutions. The template provides a structure, clarifies which components are relevant, acts as a checklist, provides the basis for a common language, invites application of the same criteria for each object of sourcing, and ensures that the versions produced by the different institutions are comparable.

The present document – which includes the comments generated by discussion – is the final version and is available to institutions so they can draw up their own Cloud Strategy.

This document provides a template for formulating a strategy. The process of actually filling it in in a way that enjoys support is outside the scope of the present document.

2. STRUCTURE OF THIS DOCUMENT:

The present document provides support by
- giving an introduction to the terms used and models for sourcing and strategy, closing with an outline of the template offered;
- dealing with the relationships with institutional and IT policy;
- positioning the Sourcing Strategy within the sourcing life cycle;
- working out the template for formulating the Cloud Strategy;
- dealing with the necessary management for the strategic, tactical, and operational components.

¹ See www.surf.nl/toolboxsourcing
² See in this context the literature on change management, for example. Within the context of Sourcing Strategy, this can be interpreted at the strategic administration/management level at the institution. The change management model constructed by John Kotter can serve as a source of inspiration: create a feeling of urgency, form a leading coalition, determine a vision, communicate that vision, reinforce action in line with that vision, achieve quick wins, persevere with change, make achieved changes permanent.
3. INTRODUCTION TO SOURCING STRATEGY

The introduction explains the sourcing terminology used here, relates this to cloud computing, provides definitions, and gives details of the models used for sourcing. It also explains how the term “strategy” is used. The introduction concludes with an outline of the Cloud Strategy template provided and makes suggestions for an initial or complete approach. This provides the basis for further elaboration of the Cloud Strategy in the following sections.

3.1 IT sourcing and cloud computing

“IT sourcing” (“right sourcing”) means the strategic, tactical, and operational activity resulting in finding, contracting, and evaluating the provider of required IT services.

Depending on the definition, cloud computing forms part of sourcing or is identical to it. The United States National Institute of Standards and Technology (NIST) defines cloud computing (August 2009) as “a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.”

The present document divides up IT sourcing into
- in-sourcing (the provider is part of the institution concerned);
- co-sourcing (the provider is a partnership with other higher education institutions); and
- out-sourcing (the provider is a commercial party).

In the case of cloud computing, a distinction is made between
- private cloud (local service, resources are own property; provisioning with own staff);
- community cloud (shared service, shared resources, shared staff); and
- public cloud (public service, commercial party’s resources and staff).

Despite subtle differences, the terms “IT sourcing” and “cloud computing” are used synonymously in the present document. The “cloud...unless” approach applied in the context of SURF should be interpreted in this terminological context as implying that the first choice is to utilise a service from the public cloud unless it is not good enough; the second choice is then a service from the community cloud, and if that is also not good enough one from the private cloud.

3.2 Models of IT sourcing

The literature distinguishes between four different models, depending on the ownership and management of components for IT services:

Business process-as-a-service (BPAAS),
An administrative process is contracted out and purchased from a provider. This generally implies SAAS, PAAS, and IAAS. One example is the processing of an organisation’s payroll by an external provider, or the collection and payment of its bills.

Software-as-a-service (SAAS),
The functionality of an application (or set of applications) is procured from a provider. In the case of SAAS, the software is owned by the provider and is “leased” together with the technical application management so as to acquire the necessary
ICT facilities and digital information provision. This generally implies PAAS and IAAS. One example is the leasing of e-mail/e-calendar/e-store from an external provider.

*Platform-as-a-service (PAAS).*
A server platform is procured together with management (hardware, operating system, database) and the organisation's own applications (or the development environment for those applications) are then run on it. PAAS generally implies IAAS because the servers are not located at the higher education institution's own ICT centre. One example is leasing Linux server capacity from a provider for an institution's own production or development environment with its own software.

*Infrastructure-as-a-service (IAAS).*
The basic infrastructure for IT services is involved, i.e. the ICT centre and network. One example of IAAS is the leasing of space and racks with servers at an off-campus data centre, together with the associated technical management.

The diagram below shows the implicit relationships between the various options.

Important factors as regards these models are the supply and demand management by the institution and the coupling management at the interfaces with the overall IT infrastructure. The way these services are divided up in the light of sourcing is an important matter when drawing up a Cloud Strategy (see below). Where the IT Sourcing Strategy is concerned, it is primarily SAAS, PAAS and IAAS that are relevant.

### 3.3 Provider of IT services

The following can act as the provider of IT services that are offered to staff, students, and third parties at the responsibility of a higher education institution:
- the institution's own ICT service, as an internal provider (in-sourcing, private cloud);
- a partnership with other higher education institutions as a (SURF) shared service (co-sourcing, community cloud);
- a commercial party that makes the service widely available on the market (out-sourcing, public cloud).

### 3.4 Examples of various alternative types of rightsourcing

In order to clarify the above, here are some examples of cases in which co-sourcing or out-sourcing has been selected as an alternative to the current system of in-sourcing:
- Cessation of investment in an institution's own ICT centre, with the relevant
capacity being acquired elsewhere (in the long run) so as to benefit from increased scale and better facilities for “sustainable ICT” (IAAS, for example public cloud);
- Acquisition of general office facilities and collaboration environments for staff and students from the cloud so as to benefit from multifunctional, cheap, and rapidly innovating facilities provided by powerful providers (SAAS, for example public cloud);
- National programme to replace an information system by a multi-tenant system with the aim of benefiting from shared management of applications and technology (SAAS, for example community cloud);
- Sharing development capacity (both expertise and platform) with other higher education institutions so as to benefit from a large development team and better quality control by sharing expertise and backup (for example community cloud).

There are also services that are less suitable for being contracted out, at least in the short term. One example (in-sourcing) is
- Closely interwoven institutional systems based, for example, on an Oracle/SAP platform because of the complexity of the numerous connections and the many satellites that have been implemented.

The term “service” is used here for the sum total of components of a particular ICT support system that can provide information, communication, and technology that can achieve the institution’s operational objectives. These components consist of software, hardware, documentation, organisation, etc., but also of such processes as application management, technical management, service management, etc. The term “information service” is therefore also used for “service”.

### 3.5 Strategy

Based on an institution’s vision and core values (or those of collaborating institutions), a strategy works out

- the objectives for the longer term (for example 3 to 5 years);
- the approach to achieving those objectives and the resources available for doing so; and
- the way that approach will be managed, progress monitored, and the result assessed.

There will be differences between the various higher education institutions as regards their current initial situation in cloud computing. Where the required final situation is concerned, they can adopt a more shared policy. In the context of SURF, the institutions have chosen a “cloud…unless” policy. One advantage of this can be that the variation between the institutions in the targeted situations will be significantly smaller, making it easier to reap the benefits of collaborating on cloud computing.

### 3.6 Sourcing Strategy Template

Section 6 deals in greater detail with the template for drawing up a Cloud Strategy. The outline of the various sections is presented in Appendix 8.5 as follows.

1. Objectives and basic principles (“to be”)
   - Objectives (in the long term) of sourcing in the light of the institutional and IT strategy
   - Basic principles as a framework for drawing up and organising the strategy

2. Existing situation (“as is”)
   - Current sourcing arrangements
   - Maturity of IT organisation as regards sourcing
   - SWOT analysis
   - Relevant external developments
   - Relevant internal developments
3. Changes to be implemented (“gap bridging”)
   - Summary of the most important changes to be implemented in the light of the
     “to be” and “as is”
4. Sourcing options and choices
   - Making the aspects explicit that must be assessed
   - Weighing up options
   - Choice of options to be worked out
5. Roadmap and resources
   - Drawing up long-term schedule based on the above choices and the
     available resources
6. Evaluation of strategic results
   - KPIs
   - Measurement methods
   - Reporting plan

3.7 Initial versus complete
The template provides a completely worked out overview of the components of an
institution’s Sourcing Strategy. An institution that is only just starting to draw up a
strategy may decide, for practical reasons, to first work out a more limited version.
This can then be enhanced on a step-by-step basis in order to arrive at a more
complete version of the strategy. This approach is appropriate given that a strategy
of this kind will not be something static but will develop dynamically according to
the current possibilities and challenges.

A minimal step-by-step plan for working out the Sourcing Strategy can involve:
1. Analysing the IT strategy as regards potential cloud objectives
2. Analysing the existing situation as regards those objectives
3. Making the “gap” explicit
4. Selecting cloud options
5. Working out those options
4. LINKING UP WITH INSTITUTIONAL OBJECTIVES AND IT POLICY

4.1 Institutional objectives

The institution’s strategy forms an important framework for the Cloud Strategy. This is indicated by the term “business-IT alignment”. That link is sometimes not an obvious one and definitely merits attention.

The diagram below indicates the components to be found in any “business” strategy, together with the relationships between them.

It is the institution’s long-term objectives, in particular, that may be relevant to the current Cloud Strategy.

Examples of an institution’s long-term objectives

Examples of an institution’s significant objectives include:

• Acquisition of more private funds for research
• More far-reaching focus for research profile
• Stronger position internationally
• Increased social contribution and impact
• Differentiated range of study programmes and improved quality through internationalisation
• Valorisation

• More collaboration with other universities, research institutions, and knowledge institutions
• Recruitment of more top-class students (including foreign students) and talented researchers
• Improved academic results for BA, MA, and PhD programmes
• Increase in number of staff with a university degree
• Improved student success rate for programmes
• Support for professional development of teaching staff
• Encouragement for lifelong learning, for example by means of flexible programmes
• Coordination of programmes with the institution’s profile and regional function
• Closer relationship with the relevant professional sectors
• Improved transition from secondary school to higher education
• Increase in number of students taking part of their programme abroad
• Improved student supervision

Examples of business support objectives
• Contribution to strategic objectives is the yardstick (business alignment)
• Concentration of service delivery within shared service centres
• Demand-driven management and agreement regarding required level of service (SLA)
• Integration, efficiency, and flexibility via architecture
• Cost reduction for investment in education and research

4.2 IT policy
The institutions have an IT policy that is coordinated with their objectives. The IT strategy is also an important framework for the Cloud Strategy.

Examples
Examples of relevant components of the IT policy include:
• Improve ICT governance (business alignment, demand-driven approach, dialogue)
• Set up service-oriented architecture (with harmonisation/standardisation of processes and component-based integration/flexibility)
• Introduce generic, efficient provision of basic services and additional, specific service delivery
• Organise integrated, personalised, advanced VLWE (anytime (24×7), anywhere, any device)
• Introduce self-service where possible
• Improve ICT support for self-organised communities for education and research
• Implement high-level information security, identity management, secure access for students, staff, guests, partners
• Achieve knowledge sharing and increased scale with sister institutions via consortiums and SURF

4.3 Incorporation into Cloud Strategy
The above matters constitute an important framework for working out the Cloud Strategy. They will therefore also be incorporated when working out the strategy.

There are also independent external developments that require higher education institutions to come up with a Cloud Strategy. The enormous increase in the use of IT services from the public cloud and the variety of devices that users now utilise are forcing institutions to formulate a strategy for responding to these developments. At the very least, it is necessary to decide how to create a bridge between the institution’s own IT environment and the cloud services that are available/utilised.
5. SOURCING STRATEGY
AS A FRAMEWORK FOR ENTIRE SOURCING LIFE CYCLE

The Sourcing Strategy covers the entire sourcing process (see the figure below\(^5\)) and structures the sourcing life cycle. This life cycle comprises the phases running from decision-making on sourcing of a service or a package of services through actual deployment of the service up to the end of the contract.

The various packages of services in the step-by-step plan are as follows:

1. **Separation and identification**
   (The object of sourcing is precisely identified and defined.)
   - Which package of tasks/services/applications is concerned (clustering of information services to be sourced)?
   - How is this package embedded within the IT architecture\(^6\)?
   - What data and data flows are concerned?

2. **Underpinning choice for out-sourcing/co-sourcing/in-sourcing**
   (Reasons are given for choosing to out-source the object.)
   - Draw up initial business case
   - Overview of market for co-sourcing or out-sourcing (perhaps requests for information)
   - Risk analysis and possible measures

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\(^5\) Based on VKA model and on Implementing Strategic Sourcing Best Practice: A Manager’s Guide to World Class Best Practices, Christine V. Bullen, Richard LeFave and Gad J. Selig, Van Hare Publishing.

\(^6\) See also SURF’s Sourcing Toolbox: TO08.
• Overall project plan with indication of project costs
• Go/No Go decision

3. Preparations for selection provider
(Overview of requirements and scope, including criteria for selecting provider.)
• Initial draft of service level agreement
• Requests for proposals sent to relevant providers
• Potential providers identified
• Necessary funding determined
• Go/No Go decision (selection of provider/providers)

4. Evaluation of offer
(Evaluation of providers’ contracts and prices, including internal audit)
• Evaluation of providers and contracts
• Guarantee for necessary budgets
• Proposal for implementation process and organisation
• Go/No Go decision

5. Commitment with provider
(Definitive contract with provider and transitional plan)
• Round off and sign contract
• Transitional plan
• Risk measures plan
• Personnel plan and training plan
• Management plan
• Testing and validation plan
• Go/No Go decision

6. Transition/implementation
(Implementation of out-sourcing)
• Controlled implementation of transitional plan
• Knowledge transfer and knowledge acquisition
• Draw up manuals and documentation
• Put management into practice
• Go/No Go decision

7. On-going IT service
(Contract management and monitoring)
• Relationship management with provider
• Procedures and roles for reporting, evaluation, and escalation
• Change management
• Quality assurance
• Update business case

8. End of contract
(Termination of contract with retention of necessary operational resources)
• Expertise and competencies
• Documentation
• Tools
• Hardware

The following elaboration of a Cloud Strategy is the preparation and framework for the above follow-up steps.
6. TEMPLATE FOR FORMULATING SOURCING STRATEGY

This section deals in greater detail with the template that is the subject of the present document. The previous sections explain how it fits in with the relevant context.

This section deals with the following main components of the template:
1. Objectives and basic principles of IT sourcing (“to be”)
2. Existing situation (“as is”)
3. Changes to be implemented (“gap bridging”)
4. Sourcing options and choices
5. Roadmap and resources
6. Evaluation of strategic results

See also Appendix 8.5, which shows the blank template.

Each of these subsections offers instructions, tools, and examples.

6.1 Objectives and basic principles of IT sourcing (“to be”)
It is crucial for the objectives of a Sourcing Strategy to be made clear. These objectives are compatible with the institution’s approach to teaching, research, and operations, and also its approach to IT.

Examples of objectives
- Use the service to offer the (minimum) quality and quantity necessary for profiling and for top-quality teaching and research.
- Increase the cost effectiveness of the service.
- Increase the flexibility of the service in the light of changing requirements.
- Speed up the time-to-market of a new service or of changes and/or expansion of an existing service.
- Improve the availability and performance of the service.
- Make access to the service independent of time, place, and device.
- Ensure maximum cohesion in services (chain cohesion, integration into the service-oriented enterprise architecture, consistency of information).
- Reduce vulnerability by means of improved service reliability.
- Improve institution’s maturity as regards IT sourcing.
- Maintain effective information security.

As its sourcing policy, the institution selects a number of basic principles for the sourcing life cycle of services.

Als sourcing beleid kiest de instelling voor een aantal uitgangspunten voor de sourcing life-cycle van services.

Examples of basic principles
1. The higher education institution (also) distinguishes between supply and demand when rightsourcing IT services. IT sourcing policy and demand management are dealt with by the institution’s Information Management unit in collaboration with the departmental/faculty information management unit and the functional information management unit at the services. Technical transition and supply management are dealt with by the institution’s own ICT service.
2. The institution selects (with reasons) the supplier for the IT services offered under its responsibility. The following may act as the supplier:
- the institution’s own ICT service, as an internal provider (in-sourcing, private cloud);
- a partnership with other higher education institutions as a (SURF) shared service (co-sourcing, community cloud);
- a commercial party that makes the service widely available on the market (out-sourcing, public cloud).

The choice of provider is made at the level of IT services for the institution’s teaching, research, and operational processes and not at the IT system level. Evaluation is primarily at the level of functional and non-functional criteria (including performance, continuity, etc.) and the necessary costs. The technology used by the provider is subordinate to this. The provider must be able to demonstrate that the quality and continuity of what it delivers are guaranteed by means of relevant, recognised certification or by means of equivalent evidence. << still to be specified in the context of SURF>>

3. The higher education institution basically selects the co-sourcing or out-sourcing model (“cloud...unless”) if
- the service is not classed as one of the primary tasks of the institution’s own IT support (co-sourcing, out-sourcing);
- the service is not specific to the institution concerned but is specific to the higher education sector (co-sourcing);
- there is a strong market for providers of the service (out-sourcing);
- the institution itself is unable to guarantee the optimum flexibility, quality, efficiency, continuity, or security necessary for the service (co-sourcing, out-sourcing).

The higher education institution basically selects the in-sourcing model if
- the service involves a clear and specific strategic interest of the institution that differs from that of other Dutch higher education institutions and contributes to the institution’s own profile;
- applicable legislation or regulations require the institution to do so;
- the institution would be highly vulnerable in the event of disruptions to the service and external providers cannot provide sufficient guarantees regarding quality, efficiency, continuity, and security.

Finally, the institution always decides to have commissioning and management of the services concerned dealt with internally.

4. The choice is ultimately confirmed by a service level agreement (SLA) between the institution and the provider. This sets out the agreed qualities, guarantees, and costs, as well as how performance will be monitored, evaluated (bonus or penalty), and if necessary altered. The SLA also includes the provisions necessary to ensure proper continuation of the contract at the end of the period for which it applies, or termination in such a way as to make effective transfer possible to a different provider (exit strategy).

5. The object of sourcing consists of properly distinguishable components (or clusters of components) (packages) within the institution’s IT architecture, with the interfaces with other linked components being clearly defined. The components can be at the level of IT infrastructure (IAAS), IT platform (PAAS), or software (SAAS). The IT architecture principles adopted by the institution apply in all cases;

\[^{10}\text{See also SURF’s Sourcing Toolbox: T013, T017, T023.}\]
for example, there may be a preference for the use of open standards for access to IT services and data exchange. Attention is paid to the principles of “strong coherence” and “loose coupling”.

6. The manageability of the IT landscape is an important aspect as the number of providers increases (multi-vendor management). Services are therefore grouped as far as possible so as to be able to select a single sourcing partner for them. Clustering is based on
- technical and functional dependencies between services (IT architecture);
- uniformity of the information domain;
- availability of external providers.

7. In the case of co-sourcing and out-sourcing, the institution guarantees the ownership and confidentiality of externally stored data pursuant to Dutch and EU law, and where this is considered necessary from the administrative point of view. The institution also guarantees the privacy of personal data in accordance with Dutch law and its own codes of conduct. All data that may be stored externally is therefore classified according to confidentiality. When a service is out-sourced to a foreign company, the SLA guarantees that the classified data falls under the proper jurisdiction and the desired confidentiality and privacy are guaranteed. The institution helps promote a shared national point of view within the Association of Universities in the Netherlands (VSNU) and the Netherlands Association of Universities of Applied Sciences (HBO-raad) and/or in the context of SURF regarding required and desired standards, also with a view to achieving a stronger negotiating position as regards this point.

8. A decision to alter the model for sourcing an IT service is based on an explicit, complete, and independent cost-benefit analysis (business case; see Appendix 8.4) for the entire period, with transitional costs being included in the new sourcing model. The personnel consequences are also an important part of this analysis.

9. Regardless of the type of sourcing, there must be a single technical helpdesk for the ICT service (primary support). The ICT service will organise the helpdesk in such a way that users can be assisted effectively without needing to be aware of the type of sourcing or of the identity of the provider. The helpdesk will be organised together with the provider’s helpdesk on the basis of the ITIL change, problem, and incident management processes.

By applying these basic principles, it is possible to draw up a decision model for deciding whether to transfer the IT service to the private cloud, community cloud, or public cloud. (See Appendix 8.3.)

6.2 Analysis of existing situation (“as is”)
This subsection outlines the existing situation as regards how the IT services are provided. It comprises the existing profile for IT support, possible limitations of that profile, relevant external trends, and internal developments.

Example of analysis
The higher education institution restricts itself almost entirely to in-sourcing for IT
The provider of the current IT services is basically located within the institution. The institution is therefore one that mainly applies the in-sourcing model for the provision of IT services.

Information management is dealt with by a strategic policy department, functional management of the institution’s systems is dealt with by the service departments
designated as the owner of the system; and the ICT service department – as a shared-service centre – is the main provider of workplace support, network and ICT centre management, server management, and technical application management and development.

The annual costs for the higher education institution are estimated to be as follows:

<table>
<thead>
<tr>
<th>Category of costs</th>
<th>Costs (M€/year)</th>
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</thead>
<tbody>
<tr>
<td>Institutional information management Management</td>
<td></td>
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<tr>
<td>Functional management</td>
<td></td>
</tr>
<tr>
<td>Operation of ICT service</td>
<td></td>
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<tr>
<td>External hiring (mainly projects)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

Only a very limited number of services are contracted out. These are currently <<to be filled in by the institution>>. Application management and technical management are hereby contracted out to an external provider and therefore form part of the model for SAAS/out-sourcing/public cloud.

**Maturity of institution’s IT sourcing**

The decision by a higher education institution to utilise cloud computing will have an impact on the way the organisation operates. Not every organisation is prepared for this. When analysing the existing organisation, it is therefore advisable to also measure maturity as regards IT sourcing and if necessary include improvement measures in the strategy.

One way of measuring an organisation’s maturity in this regard is to utilise the CMMI model (Capability Maturity Model Integration) launched by the Carnegie Mellon Software Engineering Institute in 2002. This model includes a number of well described maturity levels and ways of improving an organisation’s processes. The levels are:

1. processes are ad hoc and disorganised (initial/ad hoc)
2. processes follow a fixed pattern (repeatable but intuitive)
3. processes are documented and communicated (defined process)
4. processes are monitored and measured (managed and measurable)
5. processes follow good practices and are automated (optimised)

See Appendix 8.2 for further definition.

Because the CMMI model is not directed specifically at sourcing, Carnegie Mellon University produced the e Sourcing Capability Model (eSCM) in 2006. This rather complex model has more or less the same maturity levels as the CMMI model but links each of them to a number of good practices in the area of sourcing. This allows an institution to determine what processes must be in order so as to achieve a certain maturity. This increases the likelihood of a sourcing programme being successful.

A thorough audit based on CMMI or e-SCM to provide measurement and improvement points for the maturity of institution is too costly and time-consuming. An alternative is being developed in the context of SURF that can be used as a

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11 Zie http://www.sei.cmu.edu/cmmi/
self-assessment tool and that adopts a pragmatic approach. Using a score list, the institution can then make a rough estimate of relevant aspects of its maturity level as regards sourcing. This model also provides suggestions for improving the organisation. It will be part of the template in a later version of this document.

Example of maturity assessment according to the CMMI model

The higher education institution currently deals with the question of whether models for co-sourcing and out-sourcing are valuable on an ad hoc basis; they are only rarely substantiated with solid, independently drawn up business cases. There is no explicitly defined or consistently applied consideration of alternatives to in-sourcing where IT sourcing is concerned. The institution is therefore at level 1 or 2.

Further details of the aspects of IT sourcing that are the basis for assessing maturity are based on the processes described in the section about the sourcing life cycle.

<table>
<thead>
<tr>
<th>Level</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>Initial/ ad hoc</td>
<td>Repeatable but intuitive</td>
<td>Defined process</td>
<td>Managed and measurable</td>
<td>Optimised</td>
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<tr>
<td>Determine Sourcing Strategy</td>
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<tr>
<td>Separation and identification of sourcing object</td>
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<td>Substantiation of choice for out-sourcing/ co-sourcing/in-sourcing</td>
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<tr>
<td>Preparations for choosing provider</td>
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<td>Evaluation of bid/bids</td>
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<td>Commitment with provider</td>
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<td>Transition/implementation</td>
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<td>Regular IT service</td>
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<tr>
<td>Termination of contract</td>
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</table>

SWOT analysis in connection with IT sourcing

When describing the existing situation, it is advisable to carry out a SWOT analysis of how IT sourcing takes place at the higher education institution. The most important findings are referred to as follows in the SWOT table.

<table>
<thead>
<tr>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strengths</td>
<td>Weaknesses</td>
</tr>
<tr>
<td>&lt;&lt;To be filled in by the institution; see, for example, the maturity analysis.&gt;&gt;</td>
<td>&lt;&lt;To be filled in by the institution; see, for example, the maturity analysis.&gt;&gt;</td>
</tr>
<tr>
<td>Opportunities</td>
<td>Threats</td>
</tr>
<tr>
<td>&lt;&lt;To be filled in by the institution; remember the examples of objectives in 6.1.&gt;&gt;</td>
<td>&lt;&lt;To be filled in by the institution, for example: non-persistent national support for administration and management, lack of convincing best practices, resistance to change, etc.&gt;&gt;</td>
</tr>
</tbody>
</table>
External trends
It is undeniable that the market for cloud computing is developing rapidly. The number of providers whose scale and developmental power allow them to offer IT services at all sourcing levels is growing worldwide. This offers advantages for higher education institutions, for example faster innovation and costs determined by usage. However, such rapid development involves risks, making risk management extremely important. Risk management therefore forms part of the detailed step-by-step plan for IT sourcing.

There is executive support in the context of SURF for the higher education institutions to combine in benefiting from the added value of cloud computing, both for the Dutch higher education and research sector as a whole and for the individual institutions. A cloud computing task force has been set up in order to work out a Cloud Strategy and action plan for SURF. Active participation in this programme will allow institutions to benefit – as a minimum – from shared expertise and negotiating power. Under the direction of SURF’s CIO Consultation Group, a group of experts representing the institutions has developed a sourcing kit to help institutions determine their IT sourcing policy. This means that the institutions will not need to reinvent the wheel.

Internal developments
Example
The need for retrenchment makes it urgent to investigate the contribution that cloud computing can make.

An increasing number of staff and students are already making use of cloud services in their educational and research activities. This fact alone makes it necessary to provide an answer by means of a Sourcing Strategy. The services used include Google Apps, Windows Live, Dropbox, Box.net, Skype, MSN, LinkedIn, Facebook, Twitter, etc. Functionality is often double, i.e. provided internally but also acquired externally (often free of charge). There is also a strong tendency for staff and students to utilise their own device and to gain mobile access to IT services: “anytime, anyplace, any device”. This is made increasingly easy by means of cloud computing and open standards for access to IT services. Institutions are faced by the need to decide which IT services they will take responsibility for and which they will cease to provide.

6.3 Main changes with IT sourcing (“gap bridging”)
Based on the above analysis, this section deals with the main changes (issues) that need to be made in the light of the new IT Sourcing Strategy.

Examples
1. The maturity level of IT sourcing as a process at the higher education institution will need to be increased. The institution’s ambitions mean that levels 3 to 4 are necessary. In other words, there will need to be more systematic decision-making concerning the sourcing of IT services and its management, and this will need to be based on a properly worked out strategic and tactical framework.
2. Management of supply and demand will need to the distinguished and dealt with more clearly within the IT organisation.
3. An (overall) IT architecture is still lacking for a proper distinction between packages of IT services (“clustering”) for which a decision needs to be taken regarding IT sourcing.
The main condition for bringing about these changes ("gap bridging") involves specific efforts by the institutions directed towards these developments. Specific choices can already be made on the basis of the transition and implementation framework defined below. Institutions should therefore participate actively in SURF’s cloud computing programme so as to benefit from shared expertise, resources, and negotiating power.

6.4 Sourcing options and choices

One important component of sourcing policy is selecting packages of services/information services to be used by the institution in the course of the sourcing life cycle. The institution’s IT architecture – the process, information, and functional services and the data architecture – provide a basis for clustering.

One component of the Sourcing Strategy is, at the very least, deciding on the criteria that will form the basis for choices regarding the IT architecture.

Examples
1. The strategic importance of the data involved in the service (information service) and control of that data (this may or may not be critical for the institution’s work or mission).
2. Privacy sensitivity and the required confidentiality of data (compliance).
3. The extent of availability of the data/facilities in the light of the continuity of operational processes.
4. Ownership of the data and the consequences thereof.
5. The reliability of the available provider and the possibility of adequate governance, including SLA.
6. Competencies required internally for various types of sourcing. 13
7. Costs for service/information service.
8. Support for standardisation of relevant operational processes.

The institution can assess the value (individual and combined) of the various aspects of a package of IT services with the aid of “decision quadrants”.

Example

<table>
<thead>
<tr>
<th>Internally available competencies</th>
<th>Weak</th>
<th>Strong</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic importance of data</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>&lt;&lt;Weighted services/information services&gt;&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;&lt;Weighted services/information services&gt;&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The analyses and weightings lead to new choices of IT services that are deployed within the sourcing life cycle. It is therefore an obvious step to use co-sourcing or out-sourcing for services that process strategically unimportant data and for which only a low level of the required competencies is available internally.

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13 This means such things as negotiating, keeping the provider on its toes, cost awareness, project-based work, etc.
Examples of selection of services to be assessed

- IT platform for collaboration (including e-mail for students and/or staff)
- IT platform for simultaneous communication (multimedia)
- Middleware (Identity & Access Management, Enterprise Service Bus)
- IT platform for the institution’s Internet presence
- Hosting IT applications
- IT storage
- Housing IT hardware
- Library information system
- Academic repository
- Archiving system
- Purchasing of IT facilities

6.5 Roadmap and resources
<<To be filled in by the higher education institution>>

6.6 Evaluation of strategic results
It is a good idea to already decide when the strategy is being determined how and on the basis of what indicators the success of the selected sourcing will be determined.

Strategic determination of objectives will indicate the added value to be expected of revised sourcing. The business case indicates the cost-benefit justification for choosing a particular type of sourcing. The SLA includes operational performance indicators that will be reported on. Key performance indicators (KPIs) can be selected from these to decide whether the method of sourcing the IT services/services has been successful.

Examples of KPIs

<table>
<thead>
<tr>
<th>KPI</th>
<th>Measurement method</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Satisfaction of user, demand management and supply management¹⁵</td>
<td>• Surveys and interviews</td>
</tr>
<tr>
<td>• Availability of service and data</td>
<td>• Computerised reporting tools</td>
</tr>
<tr>
<td>• Incidents concerning the confidentiality and privacy of data</td>
<td>• Incidenten rapportage</td>
</tr>
<tr>
<td>• Flexibility of necessary and desired interim changes to the service</td>
<td>• Incident reporting</td>
</tr>
<tr>
<td>• Costs for service</td>
<td>• Financial reports</td>
</tr>
</tbody>
</table>

¹⁴ See Appendix 8.1 for a more complete list of possible objects of sourcing.
¹⁵ See the next section on strategic, tactical, and operational management.
7. STRATEGIC, TACTICAL, AND OPERATIONAL MANAGEMENT

The diagram below shows the demand-supply-governance model (DSGM) for IT services.16

The alignment function of IT sourcing occupies a central position within the model. This organisational function is an intermediary between the “demanders” and the “suppliers” of services.

The management role focuses on meeting the requirements and wishes of the organisation (and organisational components) within the frameworks of institutional policy and available resources. The Sourcing Strategy is a component of institutional policy and acts as the framework for supply management.

The most important concerns are:
- at strategic level: IT and Sourcing Strategy, architecture, and innovation;
- at tactical level: demand management and supply management;
- at operational level: service delivery management.

It is important that the institution make the following explicit for all the organisational functions in the diagram:
- who deals with them within the institution;
- how they are dealt with within the government structure for decision-making and performance monitoring.

At strategic level, it is the institution’s executive board that bears final responsibility. Domain owners also play a role in the sourcing approach for their own domain.

The management organisation will need to work out the various different roles for preparation, implementation, and maintenance/management17.

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16 See Sourcing Governance Framework. Sourcing-regie wordt kernactiviteit [Sourcing management becomes core activity], Quint Wellington Redwood; or SURF Sourcing Toolbox T030 Administrative Pointers for Sourcing

17 See also SURF's Sourcing Toolbox: T020.
8. APPENDICES

8.1 Possible objects of sourcing

**Education**
- Educational information systems
- Student information system (SIS)
- Electronic Learning Environment (ELE)
- Timetable information system (TIS)
- Digital testing system
- Plagiarism identification system

**Research**
- Library information system
- Digital library (catalogue, electronic academic journals)
- Academic repository

**Operations**
- Corporate website
- Institutional management information system
- Data warehouse
- Reporting system
- Target groups portal
- Relationship management system
- Archive information system
- HRM system
- Payroll processing system
- Satellite systems for regulations and work processes
- Financial information system
- Satellite systems for regulations and work processes
- Facilities information system
- Building management

**Middleware**
- Collaboration platform
- Shared working environment (file sharing, version management, groups management, groups calendar, planning, and tasks)
- Wiki, forum, blog, etc. (social media)
- Communication platform
- Non-simultaneous communication (e-mail, voice mail, instant messaging, announcements, etc.)
- Simultaneous communication (speech (and speech conferencing), video (and videoconferencing), chat, presence, etc.)
- Identity and access management
- Enterprise service bus

**Technology**
- Virtual server platform
- Data storage, backup, restore
- Data centre

**Expertise**
- Architect
- Project manager
- Developer
### 8.2 Maturity model CMMI

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Non-existent</td>
<td>Management processes are not applied at all. Complete lack of any recognisable processes. The enterprise has not even recognised that there is an issue to be addressed.</td>
</tr>
<tr>
<td>1</td>
<td>Initial/Ad Hoc</td>
<td>Processes are ad hoc and disorganised. There is evidence that the enterprise has recognised that the issues exist and need to be addressed. There are, however, no standardised processes; instead, there are ad hoc approaches that tend to be applied on an individual or case-by-case basis. The overall approach to management is disorganised.</td>
</tr>
<tr>
<td>2</td>
<td>Repeatable but Intuitive</td>
<td>Processes follow a regular pattern. Processes have developed to the stage where similar procedures are followed by different people undertaking the same task. There is no formal training or communication of standard procedures, and responsibility is left to the individual. There is a high degree of reliance on the knowledge of individuals and, therefore, errors are likely.</td>
</tr>
<tr>
<td>3</td>
<td>Defined Process</td>
<td>Processes are documented and communicated. Procedures have been standardised and documented, and communicated through training. It is mandated that these processes should be followed; however, it is unlikely that deviations will be detected. The procedures themselves are not sophisticated but are the formalisation of existing practices.</td>
</tr>
<tr>
<td>4</td>
<td>Managed and Measurable</td>
<td>Processes are monitored and measured. Management monitors and measures compliance with procedures and takes action where processes appear not to be working effectively. Processes are under constant improvement and provide good practice. Automation and tools are used in a limited or fragmented way.</td>
</tr>
<tr>
<td>5</td>
<td>Optimised</td>
<td>Good practices are followed and automated. Processes have been refined to a level of good practice, based on the results of continuous improvement and maturity modelling with other enterprises. IT is used in an integrated way to automate the workflow, providing tools to improve quality and effectiveness, making the enterprise quick to adapt.</td>
</tr>
</tbody>
</table>
8.3 Decision model for ICT sourcing

The table below summarises the criteria for deciding whether SAAS, PAAS, and IAAS should be acquired from the private cloud, community cloud, or public cloud.

### Example

<table>
<thead>
<tr>
<th>Private cloud</th>
<th>Community cloud</th>
<th>Public cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Specific strategic importance&lt;br&gt;- Profiling for institution&lt;br&gt;- Legal requirement&lt;br&gt;- Dependence on provider too vulnerable&lt;br&gt;- Many complex links&lt;br&gt;- Not enough amortized systems</td>
<td>- No primary support task&lt;br&gt;- Specific to higher education sector&lt;br&gt;- No qualified providers within the market&lt;br&gt;- “Private” is too vulnerable in ownership and management&lt;br&gt;- Collaboration possible in the context of SURF&lt;br&gt;- Distinct in architecture&lt;br&gt;- Legal guarantees or irrelevant</td>
<td>- No primary support task&lt;br&gt;- Broad market&lt;br&gt;- Qualified providers&lt;br&gt;- “Private” is too vulnerable in ownership and management&lt;br&gt;- Collaboration not possible in the context of SURF&lt;br&gt;- Distinct in architecture&lt;br&gt;- Legal guarantees or irrelevant</td>
</tr>
</tbody>
</table>

The following table shows the results of applying these criteria to the various different objects of sourcing. (See Appendix 8.1 for the various different objects.) This provides an overview of IT services for which co-sourcing or out-sourcing is appropriate.

### Example

<table>
<thead>
<tr>
<th>Level</th>
<th>Private cloud</th>
<th>Community cloud</th>
<th>Public cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software-as-a-service</td>
<td>- Identity management&lt;br&gt;- (Tactical) workplace support&lt;br&gt;- IT helpdesk&lt;br&gt;- Functional user support&lt;br&gt;- Data management&lt;br&gt;- Institutional management information system&lt;br&gt;- Timetable information system&lt;br&gt;- Financial and personnel satellite systems for regulations and work processes&lt;br&gt;- Facilities information system</td>
<td>- Educational information system, excluding timetable information system&lt;br&gt;- Research information system&lt;br&gt;- Library information system&lt;br&gt;- Financial and personnel information system, excluding satellite systems for regulations and work processes&lt;br&gt;- ICT collaboration platform</td>
<td>- Corporate web communication system&lt;br&gt;- Archive information system&lt;br&gt;- Financial and personnel information system, excluding satellite systems for regulations and work processes&lt;br&gt;- ICT communication platform</td>
</tr>
<tr>
<td>Platform-as-a-service</td>
<td>- Management information reporting system&lt;br&gt;- Middleware Information Systems (ESB)</td>
<td>- Server management (hosting)</td>
<td>- Server management (hosting)</td>
</tr>
<tr>
<td>Infrastructure-as-a-service</td>
<td>- Fixed and WLAN network management&lt;br&gt;- ICT purchasing</td>
<td>- Data storage&lt;br&gt;- ICT centre (housing)</td>
<td>- Data storage&lt;br&gt;- ICT centre (housing)</td>
</tr>
</tbody>
</table>
8.4 Template for business case for IT sourcing

The template below can be used and adjusted where necessary for a business case to support a sourcing decision.

Management summary

Introduction
- Objective of the business case
- Role and use of the business case
- Reason for considering out-sourcing
- Objective/objectives of out-sourcing
- What happens if no out-sourcing?
- Architecture sketch of and about the area to be out-sourced
- Overall categorisation of the functionality to be out-sourced; need to ensure that the package is also attractive for a provider
- Overall summary of the nature of the services to be out-sourced

Basic principles
- The main strategy statements and architecture principles that determine the extent and nature of the out-sourcing
- Problem areas for the main stakeholders as regards the current situation and near future
- Future developments at the company and/or within the business sector that will affect the area to be out-sourced (perhaps described as scenarios)
- Scope/quantities that are relevant to determining performance and price
- Critical success factors that the client will utilise to measure customer satisfaction with the transition and the service delivery

Business advantages to be achieved
- Financial, but also others, including innovativeness, flexibility, and response time

Current costs
- Determine what the current costs are for ICT. This is not as simple as it sounds. Our own practical experience shows that there are a lot of costs that are not explicitly charged on in the pre-out-sourcing situation. If these costs are not identified, any discussion of cost savings will be inaccurate.

Costs and benefits of the new situation
- Costs for the transition and possible run-down
- Possible one-off proceeds and costs for hardware, software, and personnel that/who are transferred to the service provider
- Costs for service delivery in the operational phase
- Costs for restructuring the institution’s own set-up so that its own processes link up seamlessly with the external services
- Management costs: demand management and vendor management
- Costs for possible contract termination and migration to a different provider
- Perhaps also costs for adaptive and preventive maintenance

Business impact
- This describes the business objectives to which the out-sourced services can make a positive contribution. For example: a faster and simpler procedure for ordering will have an influence in the form of improved customer satisfaction. However, the impact of the change that out-sourcing brings about in the organisation’s own working methods will also need to be clarified. Consideration will also need to be
given to the effect of greater flexibility and rapid application of ICT technology on new developments within the market. In some cases, alternative scenarios will have to be outlined so as to consider the variety in business impact.

**Impact as regards personnel**
- Clarify the future prospects of employees who are transferred to the service provider. Indicate clearly how their interests will be taken into account. The potential impact as regards personnel will often also need to be discussed with the works council.

**Legal impact**
- Provide a full overview of the legal consequences for the property that is transferred to the service provider.

**Risks**
- Service delivery by an external party can involve risks and the transition is often a complex project. It is therefore advisable to survey the potential risks in advance:
  - Potential failure factors during the transition
  - The organisation’s readiness for out-sourcing (strategy, architecture, organisational culture, management style)
  - Potential failure factors during service delivery (performance, stability, testing)
  - Risk involved in being dependent on the external service provider
  - Need for an emergency plan and backup facilities if service delivery is wholly or partly “down”

**Conclusions and recommendations**
- Alternative solutions
- Recommended solution
- Follow-up steps
- Scenario for transition
- Plan for management of the service provider

### 8.5 Sourcing Strategy Template

1. **Objectives and basic principles (“to be”)**

   **Objectives (in the long term) of sourcing in the light of the institutional and IT strategy**

   **Basic principles as a framework for drawing up and organising the strategy**

2. **Existing situation (“as is”)**

   **Current sourcing arrangements**

   **Maturity of IT organisation as regards sourcing**

   **SWOT analysis**
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevant external developments</td>
<td></td>
</tr>
<tr>
<td>Relevant internal developments</td>
<td></td>
</tr>
<tr>
<td>3. Changes to be implemented (&quot;gap bridging&quot;)</td>
<td><em>Summary of the most important changes to be implemented in the light of the “to be” and “as is”</em></td>
</tr>
<tr>
<td>4. Sourcing options and choices</td>
<td><em>Making the aspects explicit that must be assessed</em></td>
</tr>
<tr>
<td></td>
<td><em>Weighing up options</em></td>
</tr>
<tr>
<td></td>
<td><em>Choice of options to be worked out</em></td>
</tr>
<tr>
<td>5. Roadmap and resources</td>
<td><em>Drawing up long-term schedule based on the above choices and the available resources</em></td>
</tr>
<tr>
<td>6. Evaluation of strategic results</td>
<td><em>KPIs</em></td>
</tr>
<tr>
<td></td>
<td><em>Measurement methods</em></td>
</tr>
<tr>
<td></td>
<td><em>Reporting plan</em></td>
</tr>
</tbody>
</table>