SYSTEM INTEGRATION STANDARDS

PURPOSE

A standard includes specific low level mandatory controls that help enforce and support a policy.

The purpose of this document is to support and outline in detail the requirements of the Software Development Policy. These requirements are mandatory and must be adhered to by all members of project teams involved in software development, system support originating from Information Technology Services Application Development at Brock University, including employees (i.e., faculty, staff), consultants and / or contractors involved in the development or modification of integrations that support Brock University at an enterprise level.

This document should include integrations with in-house enterprise solution.

It should not be used for standard integration tools like Trello integrations, LTI, or features of 3rd party applications.

Requirement Levels

The wording conventions below are followed in this document:

Term	Meaning
Must	This requirement is mandatory, it is not optional.
May	If there are options provided, the implementer is able to choose one or more of the options outlined. At least 1 option **must** be selected.
Should	If business rules countermand a standard practice, deviating from the standard **must** be approved by management as a modification to the standard practice.

Definitions, Acronyms and Abbreviations

Application — Computer programs, procedures, rules and associated documentation and data pertaining to the operation of a computer system.

Application Program Interface (API) — API is code that allows two software programs to communicate with each other. The API is a set of clearly defined methods of communication between various software components.

Audit or Review (Peer Reviews)	An independent review to assess compliance with software requirements, specifications, baselines, standards, procedures, instructions and code.
Baseline	A specification or end-product that has been formally reviewed and agreed upon. This becomes the basis for further development and must go through change control procedures to be altered.
CAB (Change Advisory Board)	A cross functional group representing the various areas with ITS. This group reviews proposed changes to infrastructure, software, networking, firewall rules etc.
Cross-functional team	A group of people with different functional and technical expertise working together to achieve a common goal.
DBA	Database Administrator
Evaluation	A technique in which requirements, design, code and test results are examined in detail by a person or group to detect potential problems. The results are documented.
IT-ART	Information Technology Application Review Team. This team is responsible for reviewing applications and major modification to systems.
Mission Critical	A system or application whose failure will result in the failure of University operations.
Sign-off	The declaration that the product has met expectations and been accepted by the governing body of the project.
System	A set of programs which perform all functionality defined within a software application.
System Integration	The process of assembling the constituent parts of a system in a logical, cost-effective way, comprehensively checking system execution (all nominal & exceptional paths), and including a full functional check-out. Or

	The process of linking together different computing systems and software applications physically or functionally, to act as a coordinated whole.
System Test	The process of verifying that the system meets its requirements and validating that the system performs in accordance with the customer/user expectations.
User Acceptance Testing (UAT)	UAT testing is performed by the functional business groups that will be using the software in production. It is performed on a test/quality assurance site that is separate from the production environment.
Walkthrough	A review process in which an individual(s) leads their peers through their work product. This is used to evaluate requirements, specifications, code, documentation etc.
Web Service	Is software designed to support interoperable machine-to-machine interaction over a network. It is a standardized way of integrating web-based applications using the XML, SOAP, WSDL and UDDI open standards over an Internet protocol backbone. Systems interact with the web service in a manner prescribed by the service itself.
XML	Extensible Markup Language (XML) is a language that defines a set of rules for encoding information in a format that is both human-readable and machine-readable.

General integration

- All integrations must follow the requirements outlined in this document
- Objectives for system integration are:
  - Security of data in transit and at rest
  - Simplicity of use
  - Ruggedness (difficult to misuse, kind to errors encountered)
  - Reliability
  - Efficiency (fast enough for the purpose it was created, real-time vs regular updates)
  - Minimum development cost
  - Conform to standards

- Ensure data is sent to/received from trusted sites. Data integrity must be maintained
- Define user needs, roles and permissions (back door access by users)
- Enable non-repudiation. If system A sends a message to System B and it fails:
    - Retry the request x number of times
    - Display an error message to the user if possible
    - Send and/or log an error message to support team

- Standard naming conventions
- Consider amount of information being integrated to determine method of integration (i.e., will integration be one record on demand, or hundreds of records each time integration is run)

API Key Management

- Use one private key per application, or for multiple applications use one key for applications with similar purposes
- Name keys according to use cases
- Make the API keys read-only if the service should not be updating information
- Deliverables:
    - Document with appropriate key information, that is secured
    - All passwords and keys (security tokens, etc.) are to be stored in the Brock password program (to be identified by Brock ITS security group)

Security

- Transferring data through non-secure mediums (e.g., email, USB, inter-office mail (paper), …) is prohibited. If absolutely necessary, files must, at minimum, be password protected.
- Ensure confidentiality forms exist when dealing with 3rd party companies that work with our data. The recipient/parties involved need to be aware of the sensitivity of the data and ensure the data is protected at all times and destroyed as required
- Encryption in transit and at rest
- No re-purposing of accounts
- Strong passwords

Preferred file format

- XML
- Excel (tab, comma, etc. delimiters)

- Fixed field text (not preferred but we can handle it if other formats not available)

Preferred integration methods

- Selection of method should take into consideration performance of integration
  - Completion in timely manner
  - Real-time vs scheduled task & frequency of execution

- Volume of data (may determine the type of integration used)
- Alerts and monitoring built in
- Logging of integration activity (for debugging/auditing purposes); log successes and errors and key information (i.e., volumes of data, timestamp, recipients, etc.)

Inbound

- Web services
  - REST
  - SOAP

- APIs
  - CURL
  - Console apps
  - Vendor exposed APIs

- ETL loads
  - SSIS
  - File loads (ie/ upload of files to systems, move data from one system to another via files consumed by programs, FTP, EIB, SFTP, FTPs, SSH). Specific shares are to be used, see DBAs when using this option
  - Interfacedb
  - downloads

- BIZLink
- linked servers
  - Views

- Automated scheduling / scheduled tasks (no hands shall touch the data)
  - Use of file shares and interface DB as required. DBAs are to be contacted for their input when this type of integration is used

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