ITEC832
Enterprise Application Integration
S1 Evening 2017
Dept of Computing

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## General Information

<table>
<thead>
<tr>
<th>Unit convenor and teaching staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ian Krycer</td>
</tr>
<tr>
<td><a href="mailto:ian.krycer@mq.edu.au">ian.krycer@mq.edu.au</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credit points</th>
</tr>
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<tbody>
<tr>
<td>4</td>
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<table>
<thead>
<tr>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission to MInfoTech or MEng or MSc</td>
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<table>
<thead>
<tr>
<th>Corequisites</th>
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<tr>
<th>Co-badged status</th>
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<table>
<thead>
<tr>
<th>Unit description</th>
</tr>
</thead>
<tbody>
<tr>
<td>This unit focuses on integration technologies from internal application integration to external business-to-business integration. Integration activities start with a process model and process redesign targets. We use the market leading IBM BlueWorks Live software to define our processes. Application integration techniques such as data orientated, application interfaces, message orientated middleware and application servers are covered. The role of Web APIs and RESTful architecture is considered, as well cloud based infrastructure, platforms and SaaS. We then consider B2B integration with EDI and Web Services, and the role of portals. We explore the objectives of business process management and supply chain planning and consider a recent innovative government integration initiative as a student presented case study.</td>
</tr>
</tbody>
</table>

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at [https://students.mq.edu.au/important-dates](https://students.mq.edu.au/important-dates)

## Learning Outcomes

1. Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes for process improvement and optimisation.

2. Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.
3. Apply an understanding of integration technologies to critically analyse contemporary B2Bi case studies.

4. Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

General Assessment Information

Submission methods for assessment tasks:

All assignment submissions are soft copy, and return of marks and comments, will be done through the ITEC832 page on iLearn.

Late submission:

Late submission of individual work will incur a 10% penalty for every 24 hours, or part thereof, it is late. So within 24 hours, the maximum mark that can be obtained is 90% of the full grade for that assessment task; between 24 and 48 hours, the maximum mark that can be obtained is 80% of the full grade; and so on. No extra documentation is required unless the student does wish to have an extension (see below) applied.

Late submissions of group based assignments are not permitted unless under exceptional circumstances with documentary evidence provided to the unit convenor which may include medical certificates as per the Department of Computing policy. One person being sick does not mean the group cannot submit work. Students are recommended to have a backup plan for group based submissions.

Extensions and Disruptions:

Extensions without a grade penalty may be provided to individuals who contact student services BEFORE the due date and can provide documentary evidence of illness or other misadventure and succeed in gaining a certified disruption. (Health issues will require a university issued Professional Authority Form.). If approved, a new submission timeline and submission method will be discussed on a case by case basis.

Students are strongly advised to contact the unit convenor as early as possible if there are any issues that will not make an on-time submission possible.

If you apply for Disruption to Study for your final examination, you must make yourself available for the week of July 24 – 28, 2017. If you are not available at that time, there is no guarantee an additional examination time will be offered. Specific examination dates and times will be determined at a later date.

Final Exam (Hurdle):

The final exam will focus on content covered in the classes throughout the semester including all lectures, references and workshops.

As the final examination is a hurdle assessment, you will need a minimum performance of 40% to pass the unit. Your aggregate score must be 50% or above. If you achieve 30 to 39% in the final exam, you will be given a second chance to pass, with a new and different examination.
These second-chance hurdle examinations will also be offered in the week of July 24 - 28. Results will be released on July 13. You will be notified shortly after that date of your eligibility for a hurdle retry and you must also make yourself available during that week to take advantage of this opportunity.

**Assessment Tasks**

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Procurement Process</td>
<td>15%</td>
<td>No</td>
<td>Week 4</td>
</tr>
<tr>
<td>EHR Case Study</td>
<td>15%</td>
<td>No</td>
<td>Week 6</td>
</tr>
<tr>
<td>Group Report</td>
<td>10%</td>
<td>No</td>
<td>Week 12</td>
</tr>
<tr>
<td>Individual Presentation</td>
<td>10%</td>
<td>No</td>
<td>Various Weeks</td>
</tr>
<tr>
<td>Examination</td>
<td>50%</td>
<td>Yes</td>
<td>Week 14 or 15</td>
</tr>
</tbody>
</table>

**Hospital Procurement Process**

Due: **Week 4**

Weighting: **15%**

You are given an actual hospital procurement process. This is to be modeled as the ‘As Is’ Process using IBM Blue Works Live SaaS software. Metrics such as process cost and time are to be derived. Based on the objectives of business process reengineering, an automated, improved ‘To Be’ process is to be proposed. The new process is to be assessment according to the modeling metrics as well as a SWOT analysis and ROI justification.

This Assessment Task relates to the following Learning Outcomes:

- Apply an understanding of process modelling to analyse an existing ‘As Is’ process and be able to compare and contrast with proposed improved ‘To Be’ processes for process improvement and optimisation.
- Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.
- Apply an understanding of integration technologies to critically analyse contemporary B2Bi case studies.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.
EHR Case Study

Due: **Week 6**
Weighting: **15%**

You are given a well researched case study about the introduction of electronic medical records in the US. The case highlights the technological, management and organizational challenges of this immense application integration undertaking. Students are required to answer questions about the case study and provide As Is and To Be process models for one of the system’s components.

This Assessment Task relates to the following Learning Outcomes:

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes for process improvement and optimisation.
- Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.
- Apply an understanding of integration technologies to critically analyse contemporary B2Bi case studies.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Group Report

Due: **Week 12**
Weighting: **10%**

Students form groups of 2 to 4, depending on the class size, and choose a contemporary SaaS implementation case study from a given list of published recent studies. The team is to identify the possible opportunities for improvement to the existing As Is Process. Then, model the given new To Be Process as described in the case study and demonstrate how it delivers significant business benefits and the metrics to manage and quantify the benefits. The team is to submit a structured report comprised of each member’s contribution and then each member is to give a class presentation on their findings.

This Assessment Task relates to the following Learning Outcomes:

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes for process improvement and optimisation.
Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.

- Apply an understanding of integration technologies to critically analyse contemporary B2Bi case studies.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

**Individual Presentation**

**Due:** Various Weeks  
**Weighting:** 10%

Firstly, each group will be allocated a minor project and be expected to present their findings regarding an ongoing class case study of a contemporary B2B integration initiative. Secondly, each student is to present on their component of the Assignment 3 Group Report. It is up to each team to structure their activities to meet the overall duel requirements of the two presentations.

This Assessment Task relates to the following Learning Outcomes:

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes for process improvement and optimisation.
- Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.
- Apply an understanding of integration technologies to critically analyse contemporary B2Bi case studies.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

**Examination**

**Due:** Week 14 or 15  
**Weighting:** 50%

*This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)*

A compulsory closed book exam covering all lecture, reference and workshop material.
This Assessment Task relates to the following Learning Outcomes:

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes for process improvement and optimisation.
- Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.
- Apply an understanding of integration technologies to critically analyse contemporary B2Bi case studies.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

**Delivery and Resources**

Each week you should attend up to 4 hours of lectures and tutorials. For details of days, times and rooms consult the [timetables webpage](https://ilearn.mq.edu.au/).

Please note that you will be **required** to attend 80% of the lectures and hand in prepared work as required. Failure to do so may result in you failing the unit or being excluded from the exam.

**Recommended Texts**

The references for this unit are constantly being updated and textbooks do not keep up with the changes in technology. Hence, there is no mandatory textbook for this unit. The following texts are recommended reading:


Lecture handouts will list appropriate Web based references and further reading for some of the rapidly evolving technologies discussed in this course. All the lecture handouts and soft copy references will be available for download from the class Web site from Week 1 at: [https://ilearn.mq.edu.au/](https://ilearn.mq.edu.au/)

We are using IBM Blue Works Live for process modeling. This is a SaaS app that initially has a free 30 day trial period. We then apply for an educational licence and can use the collaborative features for Assignment Two. We use the latest BPMN 2.0 modelling notation.
Unit Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>References</th>
</tr>
</thead>
</table>
| 1    | E-Commerce Lean Methodology  
Practical – IBM Blue Works Live Tutorial | Laudon and Traver, 2017  
Mark Robinson, 2014  
IBM Training |
| 2    | BPMN 2.0  
BPM Using Blue Works Live  
E-Procurement Processes  
Release Assignment One (Individual Assignment) | BPMN.ORG  
IBM Training  
IBM, Gartner and JDA |
| 3    | Collaborative Commerce (ERP II)  
B2B Data Integration (EDI and EDI-INT)  
Release Assignment Three (Group Assignment) ‘BPM with SaaS Solutions’ | Gartner  
Coles Group Specifications Salient Retail Link, 2012 |
| 4    | Introduction to Application Integration  
Web Services  
Services Orientated Architecture  
Assignment One Due Release Assignment Two (Individual Assignment) | Roshen, 2008  
Barry, 2013 |
| 5    | SOA Case Study  
Data Orientated Application Integration  
Tutorial: Minor Project 1 | Barry, 2013  
White, 2005 and 2009 Gartner, 2013 |
| 6    | Application Integration  
- Application Interfaces and Application Servers  
Assignment Two Due  
Tutorial: Minor Project 2 | Faber Novel, 2012  
IBM, 2009  
Gartner, 2012 |
| 7    | Cloud Computing  
Hybrid Clouds  
ZapThink 2020 Enterprise Architecture Vision  
Tutorial: Minor Project 3 | Linthicum, 2009  
Gartner, 2015 |
Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:


In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

**Student Code of Conduct**

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student_conduct/](https://students.mq.edu.au/support/student_conduct/)

Unit guide ITEC832 Enterprise Application Integration

<table>
<thead>
<tr>
<th>8</th>
<th>Integration in the Healthcare Market (Guest Speaker)</th>
<th>CIO of Ramsey Healthcare</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Application Infrastructure and Middleware Market</td>
<td></td>
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<tr>
<td></td>
<td>Tutorial: Minor Project 4</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>BPM and SOA Together</td>
<td>Skalle and Hahn, 2013</td>
</tr>
<tr>
<td></td>
<td>IBM Hybrid Clouds and BPM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tutorial: Minor Project 5</td>
<td></td>
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<tr>
<td></td>
<td>Internet of Things</td>
<td></td>
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<tr>
<td></td>
<td>Tutorial: Minor Project 6</td>
<td>BI Intelligence, 2016</td>
</tr>
<tr>
<td>11</td>
<td>Tutorial – Group Assignment</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Group Presentations Assignment Three Due</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Group Presentations continued</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tutorial and Revision</td>
<td></td>
</tr>
</tbody>
</table>
Results

Results shown in iLearn, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Enquiry Service

For all student enquiries, visit Student Connect at ask.mq.edu.au

Equity Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University’s IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:
Learning outcomes

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes for process improvement and optimisation.
- Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.
- Apply an understanding of integration technologies to critically analyse contemporary B2Bi case studies.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Assessment tasks

- Hospital Procurement Process
- EHR Case Study
- Group Report
- Individual Presentation
- Examination

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes for process improvement and optimisation.
- Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.
- Apply an understanding of integration technologies to critically analyse contemporary
B2Bi case studies.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

**Assessment tasks**
- Hospital Procurement Process
- EHR Case Study
- Group Report
- Individual Presentation
- Examination

**PG - Research and Problem Solving Capability**
Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

**Learning outcomes**
- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes for process improvement and optimisation.
- Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.
- Apply an understanding of integration technologies to critically analyse contemporary B2Bi case studies.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

**Assessment tasks**
- Hospital Procurement Process
- EHR Case Study
- Group Report
- Individual Presentation
- Examination
PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes for process improvement and optimisation.
- Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.
- Apply an understanding of integration technologies to critically analyse contemporary B2Bi case studies.
- Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Assessment tasks

- Hospital Procurement Process
- EHR Case Study
- Group Report
- Individual Presentation
- Examination

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues.

This graduate capability is supported by:

Learning outcomes

- Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes for process
improvement and optimisation.
• Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.
• Apply an understanding of integration technologies to critically analyse contemporary B2Bi case studies.
• Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Assessment tasks
• Hospital Procurement Process
• EHR Case Study
• Group Report
• Individual Presentation

PG - Capable of Professional and Personal Judgment and Initiative
Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes
• Apply an understanding of process modelling to analyse an existing 'As Is' process and be able to compare and contrast with proposed improved 'To Be' processes for process improvement and optimisation.
• Critically evaluate application integration technologies such as APIs, database integration, application servers, Web Services, REST and business process management systems and be able to recommend the most suitable technology for the situation.
• Apply an understanding of integration technologies to critically analyse contemporary B2Bi case studies.
• Confidence in leadership skills; communication skills; critical analysis skills; problem-solving skills and creative thinking skills.

Assessment tasks
• Hospital Procurement Process
Standards

Four standards, namely HD, D, CR, P summarize as many different levels of achievement. Each standard is precisely defined to help students know what kind of performance is expected to deserve a certain mark. The standards corresponding to the learning outcomes of this unit are given below:

<table>
<thead>
<tr>
<th>Grade</th>
<th>LO 1</th>
<th>LO 2 and 3</th>
<th>LO 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD</td>
<td>Apply techniques and knowledge in new contexts, show breadth and depth of understanding of business process modeling and its role in justifying investment in application integration technologies.</td>
<td>A sound grounding in designing application integration architectures, understanding the web services evolution to a Services Orientated Architecture and the role of Business Process Management.</td>
<td>Demonstrate leadership, creativity, critical thinking and analysis skills. Enthusiastic in acquiring new knowledge in the application integration area. Demonstrate capability in applying new application integration knowledge to solve real-world problems. Conduct team work effectively and play a key role in moving the whole project team forward.</td>
</tr>
<tr>
<td>D</td>
<td>Apply techniques and knowledge in some new contexts, show breadth and depth of understanding of across most of the business process modeling topics and its role in justifying investment in application integration technologies.</td>
<td>Apply techniques and knowledge in some new contexts, show breadth and depth of understanding across most of the topics: designing application integration architectures, understanding the web services evolution to a Services Orientated Architecture and the role of Business Process Management.</td>
<td>Demonstrate some leadership occasionally. Show creativity, critical thinking and analysis skills. Have the capability in applying application integration knowledge to solve real-world problems. Collaborate with team members well and finish assigned tasks on time and with good quality.</td>
</tr>
<tr>
<td>CR</td>
<td>Show breadth of understanding across most of the business process modeling topics and its role in justifying investment in application integration technologies.</td>
<td>Show breadth of understanding across most of designing application integration architectures, understanding the web services evolution to a Services Orientated Architecture and the role of Business Process Management.</td>
<td>Demonstrate analysis skills in some occasions. Know how to apply application integration to solve some of the real-world problems. Able to finish assigned tasks on time and with good quality most of the time.</td>
</tr>
<tr>
<td>P</td>
<td>Can reproduce definitions and ideas, show some breadth of understanding of the business process modeling topics and its role in justifying investment in application integration technologies.</td>
<td>Can reproduce some definitions and ideas, show some breadth on issues in how breadth of understanding across most of designing application integration architectures, understanding the web services evolution to a Services Orientated Architecture and the role of Business Process Management.</td>
<td>Demonstrate limited analysis skills. Can apply application integration knowledge to solve limited real-world problems. Able to finish all assigned tasks on time and with acceptable quality.</td>
</tr>
</tbody>
</table>

In this unit, your final grade depends on your performance in each part of the assessment. For each task, you receive a mark that combines your standard of performance regarding each learning outcome assessed by this task. Then the different component marks are added up to
determine your total mark out of 100. Your grade then depends on this total mark and your overall standards of performance.

In order to pass the unit, you must obtain a total mark of 50% or higher.

**Changes since First Published**

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>19/02/2017</td>
<td>Add Outline and a few paragraphs in the Standards Section about a 50% pass mark.</td>
</tr>
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