



# Course Workbook

1<sup>st</sup> Edition

# Contents

SUCCEED IN THIS COURSE.....	4
<b>MODULE 1: SYSTEM INTEGRATION OVERVIEW.....</b>	<b>5</b>
Lesson 1: What is systems integration .....	6
Lesson 2: The three types of systems integration.....	7
Lesson 3: The integrated systems lifecycle.....	8
<b>MODULE 2: SELLING INTEGRATED SYSTEMS .....</b>	<b>10</b>
Process Overview: The Integration Sales Process .....	11
Lesson 1: Why do you want to integrate?.....	12
Lesson 2: Defining the integration business use case .....	13
Lesson 3: Creating a business case for integration.....	14
Exercise 1: Creating a business use case .....	15
<b>MODULE 3: SPECIFYING AND SCOPING INTEGRATED SYSTEMS .....</b>	<b>16</b>
Process 1: The integration specifying process .....	17
Process 2: The integration scoping process.....	18
Lesson 1: From use case to specification.....	19
Lesson 2: The Informational process for integration specifications.....	21
Lesson 3: Performance based integration specification .....	22
Exercise 1: Creating a performance specification .....	24
Lesson 4: Prescriptive integration specification .....	25
Exercise 2: Creating a prescriptive specification .....	27
Lesson 5: Scoping integration .....	28
Exercise 3: Creating an integration scope.....	29
<b>MODULE 4: DESIGNING INTEGRATED SYSTEMS.....</b>	<b>30</b>
Process 1: Integration design process.....	31
Lesson 1: Formal use case design.....	32
Lesson 2: Use case map.....	33
Exercise 1: Creating a use case map.....	35
Lesson 3: Data flow map .....	36
Exercise 2: Creating a data flow map .....	38
Lesson 4: System architecture.....	39
Exercise 3: Creating a system architecture.....	40
Lesson 5: Physical design.....	41
Exercise 4: Creating a physical design .....	42

<b>MODULE 5: IMPLEMENTING INTEGRATED SYSTEMS.....</b>	<b>43</b>
Process 1: Integration implementation process .....	44
Lesson 1: Implementation kickoff.....	45
Lesson 2: Vendor and system alignment .....	46
Lesson 3: Material ordering.....	47
Lesson 4: Integration scheduling.....	48
Lesson 5: Physical Integration implementation .....	49
Exercise 1: Implementing a Physical Integration .....	50
Lesson 6: Protocol Integration implementation.....	51
Exercise 2: Implementing a protocol integration .....	52
Lesson 7: Programmatic Integration implementation.....	53
Exercise 3: Implementing a programmatic integration.....	55
<b>MODULE 6: SUPPORTING INTEGRATED SYSTEMS.....</b>	<b>56</b>
Process 1: Integration support process .....	57
Lesson 1: Roles and responsibilities in an integrated system .....	58
Lesson 2: Maintaining integrations and interfaces .....	59
Lesson 3: Defining the integration support schedule .....	60
Exercise 1: Create a post install support plan.....	61
Lesson 4: Retrofitting and upgrading existing integrations.....	62

## SUCCEED IN THIS COURSE

Over the past year we've created several training courses for our students. As we look back at our past students we've pinpointed two things that make our students successful:

1. Access the program, watch the videos three times, and comment in the discussion board. The action of watching the videos and engaging with us and fellow students will naturally increase the amount of information you retain.
2. Work through this workbook. This workbook was designed to help you retain key pieces of information that have a direct impact on your performance as a BAS professional. As you move through each lesson we will ask you questions in the workbook that will help you to further expand your knowledge.

Don't skimp on these two actions. The reality is learning anything takes work. Fortunately for you, we've condensed that learning into the shortest time possible.

When you follow the two steps above you will see massive results as you work through this course.

Remember, we are here for you at any time via the discussion section and live office hours.

We look forward to hearing about your success story.

To your success,

-The BAM Team

# MODULE 1: SYSTEM INTEGRATION OVERVIEW

In this module we are going to go through a brief overview of systems integration. Here are the lessons for this module.:

- Lesson 1: What is systems integration
- Lesson 2: The three types of systems integration
- Lesson 3: The integrated systems lifecycle

How do you integrate system? Before we even answer that question, we need to make sure that we are speaking the same language. This module will address this need by ensuring that we have properly defined both systems integration as well as the systems integration lifecycle.

This is an extremely important module so be sure to not skip any of the lessons.

# Lesson 1: What is systems integration

## Lesson Objectives:

- Describe what systems integration is
- Explain when to use systems integration

What is the main purpose of systems integration?

How would you determine if a system needs to be integrated?

Does systems integration require protocols and API's? Why or why not?

# Lesson 2: The three types of systems integration

## Lesson Objectives:

- Describe the three types of systems integration
- Explain when you would use each type

What are the three types of systems integration?

- 1.
- 2.
- 3.

When would you use each type of integration? When would you not?

1. Integration Type 1:
  - a. When to use:
  - b. When not to use:
2. Integration Type 2:
  - a. When to use:
  - b. When not to use:
3. Integration Type 3:
  - a. When to use:
  - b. When not to use:

# Lesson 3: The integrated systems lifecycle

## Lesson Objectives:

- Describe the integrated systems lifecycle
- Explain the main tasks of each step in the lifecycle

What are the five steps of the integrated systems lifecycle?

- 1.
- 2.
- 3.
- 4.
- 5.

What are the main tasks in **Step 1** of the integrated systems lifecycle?

- 1.
- 2.

What are the main tasks in **Step 2** of the integrated systems lifecycle?

- 1.
- 2.
- 3.

What are the main tasks in **Step 3** of the integrated systems lifecycle?

- 1.
- 2.
- 3.
- 4.
- 5.



What are the main tasks in **Step 4** of the integrated systems lifecycle?

- 1.
- 2.
- 3.
- 4.

What are the main tasks in **Step 5** of the integrated systems lifecycle?

- 1.
- 2.
- 3.

## MODULE 2: SELLING INTEGRATED SYSTEMS

In this module we will be exploring the integration sales process. All systems integration processes begin with a sale, so it is important to understand the right way to sell integration projects. The lessons in the module are:

- Process Overview: The Integration Sales Process
- Lesson 1: Why do you want to integrate?
- Lesson 2: Defining the integration use case
- Lesson 3: Creating a business case for integration
- Exercise 1: Creating a business use case

Now you may be wondering why does a technical person need to understand the sales process. After all you aren't in sales!

You are 100% wrong. I (Phil Zito) have personally sold dozens of integration projects **AS A TECHNICIAN**.

When you learn how to connect your technical solutions with business value you will become one of the most valuable assets to your company. Very few people can identify a business problem and create a technical solution for that problem.

In this module I will give you those tools. Plus, it's always nice to have the sales people owe you a year full of free lunches 😊.

# Process Overview: The Integration Sales Process

## Lesson Objectives:

- Describe the integration sales process

What are the four steps of the integration sales process?

- 1.
- 2.
- 3.
- 4.

# Lesson 1: Why do you want to integrate?

## Lesson Objectives:

- Understand the three reasons for integration

What are the three main reasons for integrating systems?

- 1.
- 2.
- 3.

How do you identify the real reason behind the desire to integrate?

Why is it important to understand the reason for integrating systems?

# Lesson 2: Defining the integration business use case

## Lesson Objectives:

- Explain what a business use case is

What information do you need to define the business use case?

How is a business use case different than a technical use case?

Why must the business use case come before the technical use case?

What is ROI?

What are KPI's?

What is a stakeholder?

What is an influencer?

# Lesson 3: Creating a business case for integration

## Template Documents:

- Business Use Case Template

## Lesson Objectives:

- Describe the key parts of a business use case
- Explain how to create a business use case

What are three parts of the business use case?

# Exercise 1: Creating a business use case

## Exercise Documents:

- Business use case exercise
- Customer narrative

## Template Documents:

- Business Use Case Template

## Lesson Objectives:

- Demonstrate the ability to create a business use case

**Perform Business use case exercise**

## MODULE 3: SPECIFYING AND SCOPING INTEGRATED SYSTEMS

In this module we are going to explore the process of specifying and scoping integrated systems. The lessons in the module are:

- Process 1: The integration specifying process
- Process 2: The integration scoping process
- Lesson 1: From use case to specification
- Lesson 2: The Informational process for integration specifications
- Lesson 3: Performance based integration specification
- Exercise 1: Creating a performance specification
- Lesson 4: Prescriptive integration specification
- Exercise 2: Creating a prescriptive specification
- Lesson 5: Scoping integration
- Exercise 3: Creating an integration scope

Properly integrating systems begins with the scope and design. In this module we are going to deal with the scope.

Have you ever read a specification and saw the phrase “integration to be field coordinated” and thought to yourself, yeah right, that never happens!

If so you’re not alone field coordination almost always ends poorly. But what can you do about it?

In this module I will teach you how to utilize the specification to your advantage to create contractual language that clearly defines the responsibilities of each individual contractor!



# Process 1: The integration specifying process

## Lesson Objectives:

- Describe the integration specifying process

What are the steps in specifying integration?

What are the owner's responsibilities during the integration specifying process?

What are the engineer's responsibilities during the integration specifying process?

What are the general contractor's responsibilities during the integration specifying process?

What are the control contractor's responsibilities during the integration specifying process?

# Process 2: The integration scoping process

## Lesson Objectives:

- Describe the integration scoping process

What are the four steps of the integration scoping process?

- 1.
- 2.
- 3.
- 4.

How can you accurately scope an integration without a design?

What are the primary risks during the scoping process?

# Lesson 1: From use case to specification

## Lesson Objectives:

- Explain the process of transforming a use case into a specification

How does a use case fit into the CSI specification model?

What are the three areas of the specification that you will need to transfer your use case to?

- 1.
- 2.
- 3.

What are the two kinds of specifications?

- 1.
- 2.



# Lesson 2: The Informational process for integration specifications

## Lesson Objectives:

- Explain how to capture information required for integration specifications

What are the three biggest pieces of information you need to create an integration specification?

- 1.
- 2.
- 3.

How do you address having no integration design during the specifying phase?

# Lesson 3: Performance based integration specification

## Lesson Objectives:

- Describe the purpose of a performance specification
- Explain how performance specifications are created

What is a performance specification?

What is the main purpose of a performance specification?

What are the risks of a performance specification?

How can you deal with these risks?

Can a performance specification have prescriptive elements? How?

In your own words how do you create a performance specification?

# Exercise 1: Creating a performance specification

## Exercise Documents:

- Creating a Performance Specification Exercise
- Business use case from Module 2 Exercise 1

## Template

- Integration Specification Template

## Lesson Objectives:

- Create a performance specification

## Perform Performance Specification Exercise



# Lesson 4: Prescriptive integration specification

## Lesson Objectives:

- Describe the purpose of a prescriptive specification
- Explain how prescriptive specifications are created

What is a prescriptive specification?

What is the main purpose of a prescriptive specification?

What are the risks of a prescriptive specification?

How can you deal with these risks?

Can a prescriptive specification have performance elements? How?

In your own words how do you create a prescriptive specification?

# Exercise 2: Creating a prescriptive specification

## Exercise Documents:

- Creating a Prescriptive Specification Exercise
- Business use case from Module 2 Exercise 1

## Template

- Integration Specification Template

## Lesson Objectives:

- Create a prescriptive specification

## Perform Prescriptive Specification Exercise

# Lesson 5: Scoping integration

## Lesson Objectives:

- Describe the purpose of an integration scope
- Explain how integration scope is created

What is an integration scope?

What are the three main parts of an integration scope?

How can you write a scope without a design?

Are scopes mainly prescriptive or performance? Why?

What are the four steps for creating an integration scope?

- 1.
- 2.
- 3.
- 4.

# Exercise 3: Creating an integration scope

## Exercise Documents:

- Creating an Integration Scope
- Business use case from Module 2 Exercise 1

## Template

- Integration Scope Template

## Lesson Objectives:

- Create an integration scope

## Perform Integration Scope Exercise

# MODULE 4: DESIGNING INTEGRATED SYSTEMS

In this module we are going to dive deep into the design process. The lessons in the module are:

- Process 1: Integration design process
- Lesson 1: Formal use case design
- Lesson 2: Use case map
- Exercise 1: Creating a use case map
- Lesson 3: System architecture
- Exercise 2: Creating a system architecture
- Lesson 4: Data flow map
- Exercise 3: Creating a data flow map
- Lesson 5: Physical design
- Exercise 4: Creating a physical design

If being able to align a business case to a technical solution is the most valuable skillset you can have then designing an integrated system is a very close second.

The ability to document a technical solution in a way that other contractors can understand is invaluable. The good news is this skill is a simple set of processes and this module will teach you how to do those processes.

# Process 1: Integration design process

## Lesson Objectives:

- Describe the integration design process

What are the four phases of the integration design process?

- 1.
- 2.
- 3.
- 4.

What is versioning?

How do you manage multiple designers?

What is iteration?

How does the iteration process work?

How can you involve technology partners in the design process?

# Lesson 1: Formal use case design

## Lesson Objectives:

- Describe how to create a use case design
- Explain what makes up a use case design

What is the purpose of creating a formal use case design?

How is a formal use case different than a business use case?

What are the four pillars of a design that support a use case?

- 1.
- 2.
- 3.
- 4.

What does it mean that a use case is supported by the pillars of a design?

How do you create a formal use case design?



## Lesson 2: Use case map

### Template

- Use case map template

### Lesson Objectives:

- Describe how to create a use case map

What is the purpose of a use case map?

What is an actor?

What is a system?

What is a trigger?

What is a failure state?

What is a flow?

What is a primary flow?

What is an alternative flow?

What is a nested use case?

What are preconditions?

What are postconditions?

# Exercise 1: Creating a use case map

## Exercise Documents:

- Creating a Use Case Map Exercise
- Integration specification from Module 3 Exercise 1
- Lutron Points List
- Access Control Points List
- API Documentation (see link below video)

## Template

- Use Case Map Template
- Use Case Map Checklist

## Lesson Objectives:

- Create a use case map

## Perform use case map Exercise

# Lesson 3: Data flow map

## Template

- Data flow map template

## Lesson Objectives:

- Describe how to create a data flow map

What is data?

What is a data set?

What is relational vs nonrelational data?

What are protocols?

What is data flow?

What is a data conflict?

What are data adapters?

How do you create a data flow map?

What are the four primary parts of the data flow map?

- 1.
- 2.
- 3.
- 4.

# Exercise 2: Creating a data flow map

## Exercise Documents:

- Creating a Data Flow Map Exercise
- Integration specification from Module 3 Exercise 1
- Lutron Points List
- Access Control Points List
- API Documentation (see link below video)

## Template

- Data Flow Map Template
- Data Flow Map Checklist

## Lesson Objectives:

- Create a Data flow map design

## Perform Data Flow Map Exercise

# Lesson 4: System architecture

## Template

- System architecture template

## Lesson Objectives:

- Describe how to create a system architecture

What is the purpose system architecture?

What are the four main pieces of a system?

- 1.
- 2.
- 3.
- 4.

How granular do we get in a system architecture?

How do we create a system architecture?

# Exercise 3: Creating a system architecture

## Exercise Documents:

- Creating a System Architecture Exercise
- Integration specification from Module 3 Exercise 1
- Lutron Points List
- Access Control Points List
- API Documentation (see link below video)

## Template

- System Architecture Template
- System Architecture Checklist

## Lesson Objectives:

- Create a system architecture

## Perform System Architecture Exercise



# Lesson 5: Physical design

## Template

- Physical design template
- Physical design checklist

## Lesson Objectives:

- Describe how to create a physical design

What is the purpose of a physical design?

What is the difference between a physical design and a system architecture?

What are the four parts of a physical design?

- 1.
- 2.
- 3.
- 4.

How do you create a physical design?

# Exercise 4: Creating a physical design

## Exercise Documents:

- Creating a Physical Design Exercise
- Integration specification from Module 3 Exercise 1
- Lutron Points List
- Access Control Points List
- API Documentation (see link below video)

## Template

- Physical Design Template
- Physical Design Checklist

## Lesson Objectives:

- Create a physical design

## Perform Physical Design Exercise

# MODULE 5: IMPLEMENTING INTEGRATED SYSTEMS

In this module we are going to get hands on! The lessons in the module are:

- Process 1: Integration implementation process
- Lesson 1: Implementation kickoff
- Lesson 2: Vendor and system alignment
- Lesson 3: Material ordering
- Lesson 4: Integration scheduling
- Lesson 5: Physical Integration implementation
- Exercise 1: Implementing a physical integration
- Lesson 6: Protocol Integration implementation
- Exercise 2: Implementing a protocol integration
- Lesson 7: Programmatic Integration implementation
- Exercise 8: Implementing a programmatic integration

At the end of the day you need to be able to implement an integrated system in a project or retrofit environment. You may not believe it right now, but this is the easiest step of the entire process. In this module you will gain hands on experience with each of the three types of integrations.

# Process 1: Integration implementation process

## Lesson Objectives:

- Describe the integration implementation process

What is the primary objective of the integration implementation process?

Can you complete an integration implementation without a design?

What are the three types of integration implementations?

- 1.
- 2.
- 3.

What is the #1 rule of integration implementation?

# Lesson 1: Implementation kickoff

## Template

- Implementation Kickoff Checklist

## Lesson Objectives:

- Explain the purpose of the implementation kickoff
- Describe how to conduct an implementation kickoff

What is an implementation kickoff meeting?

Why are implementation kickoff meetings important?

Who needs to be at the implementation kickoff meeting?

What are the primary goals of the implementation kickoff meeting?

# Lesson 2: Vendor and system alignment

## Template

- Vendor and System Alignment Checklist

## Lesson Objectives:

- Explain the purpose behind vendor and system alignment
- Describe strategies for achieving vendor and system alignment

What is vendor alignment?

What is system alignment?

How are they different? How are they the same?

Why is it important to have alignment between your vendor and systems?

What are the three most common areas of misalignment?

- 1.
- 2.
- 3.

# Lesson 3: Material ordering

## Template

- Material Ordering Checklist

## Lesson Objectives:

- Explain the unique aspects to material ordering for integrations

How can integration work change how you order material?

How can you determine the “key” items that need to be ordered?

What is meant by the phrase a “complete system”?

What are the three most commonly missed integration materials?

- 1.
- 2.
- 3.

# Lesson 4: Integration scheduling

## Template

- Integration Schedule Template

## Lesson Objectives:

- Describe how to schedule integration

What are the 5 steps of any integration (regardless of type)?

- 1.
- 2.
- 3.
- 4.
- 5.



# Lesson 5: Physical Integration implementation

## Template

- Physical Integration Checklist

## Lesson Objectives:

- Describe the physical integration process

What is a physical integration?

What are the two types of physical integrations?

- 1.
- 2.

What are the three pieces of information you need for a physical integration?

What part of the design phase is “most” important for physical integrations?

# Exercise 1: Implementing a Physical Integration

## Exercise Documents:

- Implementing a Physical Integration Exercise
- Integration specifications from Module 3 Exercise 1 and 2
- Integration scope from Module 3 Exercise 3
- Integration Design from Module 4 Exercise 1 through 5

## Template

- Physical Integration Checklist

## Lesson Objectives:

- Implement a physical integration

## Implement a physical integration Exercise

# Lesson 6: Protocol Integration implementation

## Template

- Protocol Integration Checklist

## Lesson Objectives:

- Describe the protocol integration process

What is a protocol?

What are protocol stacks?

What are protocol integrations?

Why must you understand the “rules” of the protocol(s) you are working with?

What part of the design phase is “most” important for protocol integrations?

# Exercise 2: Implementing a protocol integration

## Exercise Documents:

- Implementing a Protocol Integration Exercise
- Integration specifications from Module 3 Exercise 1 and 2
- Integration scope from Module 3 Exercise 3
- Integration Design from Module 4 Exercise 1 through 5

## Template

- Protocol Integration Checklist

## Lesson Objectives:

- Implement a Protocol integration

## Implement a Protocol integration Exercise

# Lesson 7: Programmatic Integration implementation

## Template

- Programmatic Integration Checklist

## Lesson Objectives:

- Describe the programmatic integration process

What is the purpose behind programmatic integration?

What is an API?

What is request/response?

What is data adaption?

What is a data type?

What part of the design phase is “most” important for programmatic integrations?

# Exercise 3: Implementing a programmatic integration

## Exercise Documents:

- Implementing a programmatic Integration Exercise
- Integration specifications from Module 3 Exercise 1 and 2
- Integration scope from Module 3 Exercise 3
- Integration Design from Module 4 Exercise 1 through 5

## Template

- Programmatic Integration Checklist

## Lesson Objectives:

- Implement a programmatic integration

## Implement a programmatic integration Exercise

# MODULE 6: SUPPORTING INTEGRATED SYSTEMS

In this module we are going to discuss how to support integrated systems. The lessons in the module are:

- Process 1: Integration support process
- Lesson 1: Roles and responsibilities in an integrated system
- Lesson 2: Maintaining integrations and interfaces
- Lesson 3: Defining the integration support schedule
- Exercise 1: Create a post install support plan
- Lesson 4: Retrofitting and upgrading existing integrations

The single biggest reason for integrated systems failing is due to post warranty support. In most cases there is no plan to support an integration after its implementation.

By not establishing a proper post install support plan you are almost ensuring that your customer will not achieve their outcomes. On top of this you are missing the opportunity to establish a high-quality relationship with the customer.

This module will teach you how to easily establish a post install support plan.



# Process 1: Integration support process

## Lesson Objectives:

- Describe the integration support process

What is the purpose of the support process?

What is the most common reason for integrations failing?

What is the most important action for supporting integrations?

What does it mean that supporting integrations is a team effort?

What are the three pillars of post install integration support?

- 1.
- 2.
- 3.

# Lesson 1: Roles and responsibilities in an integrated system

## Template

- Integration Support Matrix

## Lesson Objectives:

- Describe the roles and responsibilities for post install integration support

What is an integration owner?

What is the purpose of an integration support matrix?

What are the three most common support activities?

# Lesson 2: Maintaining integrations and interfaces

## Lesson Objectives:

- Explain the common integration and interface maintenance strategies

What are the three most common parts of integrations that need to be maintained?

- 1.
- 2.
- 3.

What is the role of coordination in integration maintenance?

What is the difference between planned and unplanned maintenance?

# Lesson 3: Defining the integration support schedule

## Lesson Objectives:

- Describe how to create an integration support schedule

What is an integration support schedule?

What are the four things that an integration support schedule must cover?

- 1.
- 2.
- 3.
- 4.

# Exercise 1: Create a post install support plan

## Exercise Documents:

- Implementing a Protocol Integration Exercise
- Integration specifications from Module 3 Exercise 1 and 2
- Integration scope from Module 3 Exercise 3
- Integration Design from Module 4 Exercise 1 through 5

## Template

- Integration Support Matrix

## Lesson Objectives:

- Create a post install support plan

## Create a post install support plan Exercise

# Lesson 4: Retrofitting and upgrading existing integrations

## Template

- Integration retrofit checklist
- Integration upgrade checklist

## Lesson Objectives:

- Explain the common challenges of retrofitting and upgrading existing integrations

What is the difference between a retrofit and upgrade?

What are the 5 steps for performing a integration retrofit?

- 1.
- 2.
- 3.
- 4.
- 5.

What are the 4 steps for performing a integration upgrade?

- 1.
- 2.
- 3.