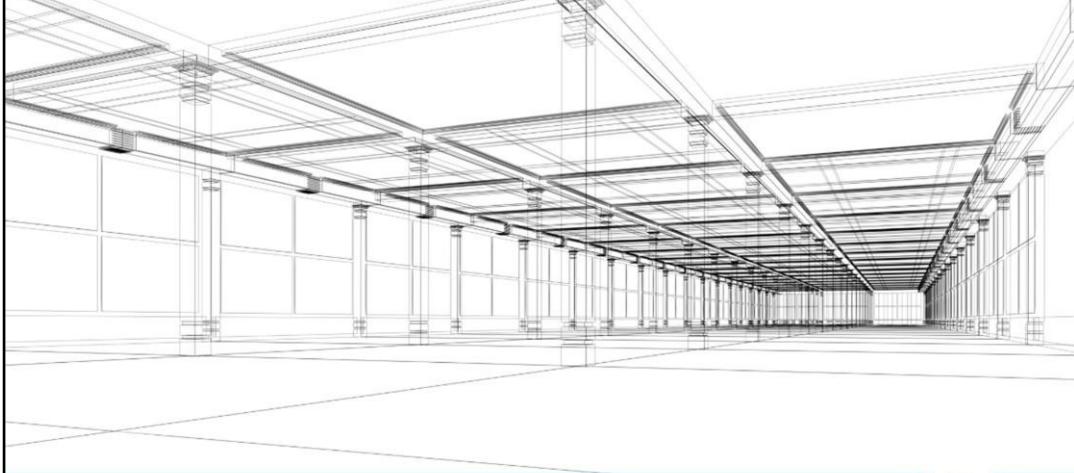


Introduction to Architectural Thinking



Module 6 Architect Specializations



Version 2

Architectural Thinking

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In the sixth module of the Introduction to Architectural Thinking course, we will discuss the Architect specializations.

Module Outline



► **Introduction and Objectives**

What are Architect specializations?

Business Architecture

Enterprise Architecture

IT Architecture – Application Architecture

IT Architecture – Information Architecture

IT Architecture – Integration Architecture

IT Architecture – Technology Architecture

Applying Capabilities from Multiple Specializations

Summary

We will begin with Introduction and Objectives.



Architect specializations:

- Description of IBM Architect specializations
- For each specialization:
 - Description
 - Capabilities
 - Experience
 - Typical projects
 - Why Architects choose the specialization
 - Personal experience
- Tasks needed to apply capabilities across specializations



This module describes the Architect specializations. It begins with a description of the IBM Architect specializations. Then each of the Architect specializations is explained in terms of a general description, capabilities, experience, typical projects, why Architects choose the specialization, and personal experience presented by an Architect currently in that specialization. Finally, the tasks needed to apply capabilities across specializations are explained.

Learning Objectives



At the end of this module, you should be able to:

- Explain what Architect specializations are
- Identify the Architect specializations
- Explain how specializations fit in Architect Certification
- Describe each specialization
- Describe the capabilities associated with the specializations
- Discuss experiences related to the specializations
- Describe typical projects
- Gain insight on typical career paths and projects associated with the specializations
- Explain what the Architect can do to offset the lack of expertise in a particular specialization



At the end of this module, you should be able to explain what the Architect specializations are, identify the Architect specializations, explain how specializations fit in Architect Certification, describe each specialization, describe the capabilities associated with the specializations, discuss experiences related to the specializations, describe typical projects, gain insight on typical career paths and projects associated with the specializations, and explain what the Architect can do to offset the lack of expertise in a particular specialization.

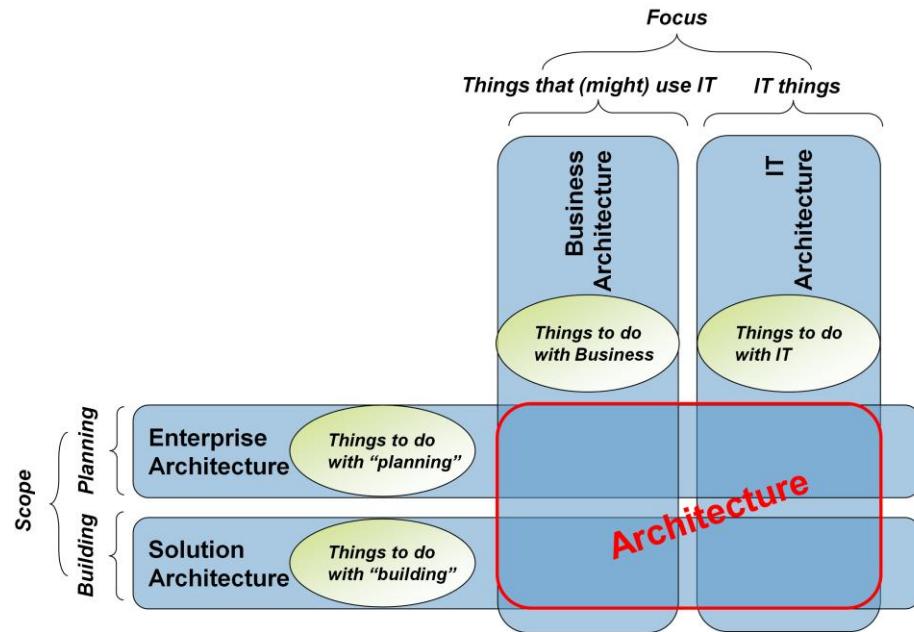
Module Outline



- Introduction and Objectives
- ▶ **What are Architect specializations?**
- Business Architecture
- Enterprise Architecture
- IT Architecture – Application Architecture
- IT Architecture – Information Architecture
- IT Architecture – Integration Architecture
- IT Architecture – Technology Architecture
- Applying Capabilities from Multiple Specializations
- Summary

The next topic is: What are Architect specializations?

Architecture Reference Framework



6

Architectural Thinking

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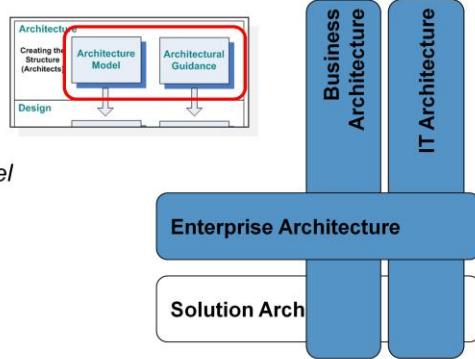
Recall the 2 by 2 reference framework introduced in the What is Architecture module. Horizontally, we have the Enterprise and Solution Architecture scope and vertically are the Business and IT Architecture focuses.



IBM's Architect profession supports three distinct specializations, aligned to this architecture landscape.

Embracing both models and guidance:

- Business Architects "do" BA:
 - At both EA and SA levels
- IT Architects "do" ITA:
 - Mostly at the SA level
- Enterprise Architects "do" EA:
 - Across both BA and ITA
 - They often own guidance at SA level



The Architect profession in IBM supports three distinct specializations that are aligned to the architecture landscape we described. As shown here, Business Architecture's scope includes both Enterprise Architecture and Solution Architecture.

IT Architects in IBM mostly perform at the Solution Architecture level. Enterprise Architecture's focus is across both Business Architecture and IT Architecture. And, when we include the third dimension that involves models and guidance, Enterprise Architects often own the guidance at the Solution Architecture level, as well.

IT Architecture Sub-Specializations

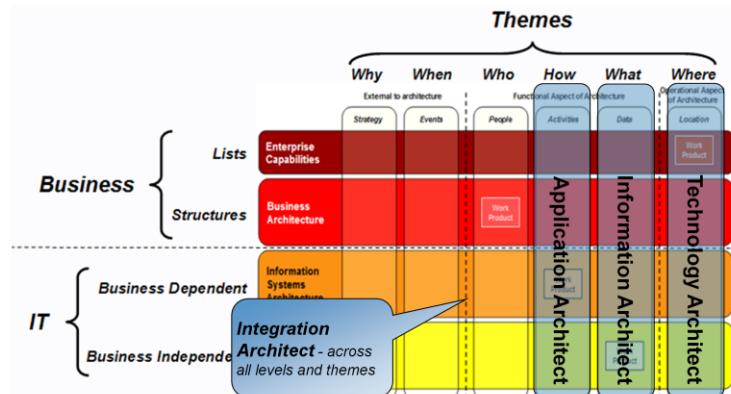


The IT Architecture specialization has four sub-specializations, focused on “themes” or “slices” through the IT Architecture domain.

They address specific architectural concerns:

- At all “scopes” (EA and SA)
- Covering “modeling” as well as “guidance”

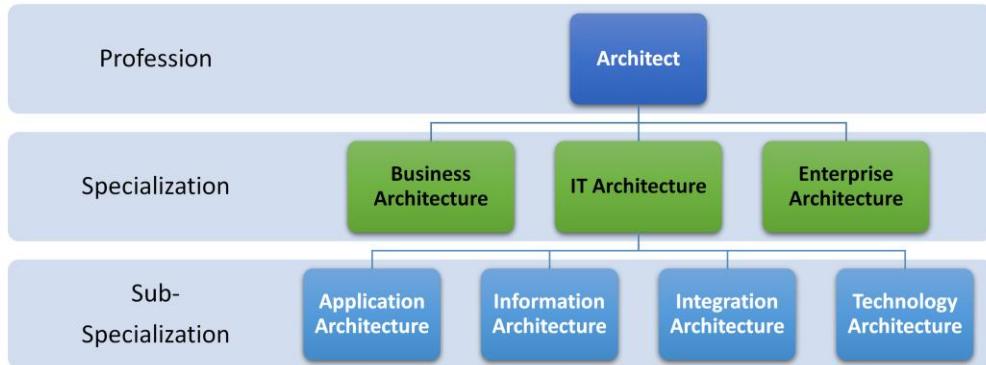
All recognize the need
to flow between
business and IT
domains, *within their
own specialization*.



Four sub-specializations are defined within the IT Architecture specialization. Each of them focuses on specific themes or slices through the IT Architecture domain.

Application Architects are focused on the “how”; Information Architects are focused on the “what”; the Technology Architects are focused on the “where”; and the Integration Architects are concentrating on the challenges of integrating multiple systems across all levels and themes. They all recognize the flow between business and IT domains within their own specialization.

Specialization Structure



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Architectural Thinking

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In summary, this is the specialization structure currently defined in the Architect profession. The structure is flexible enough that specializations or sub-specializations can be added or removed depending on business needs.

For simplicity, in our tools and documents, we often refer to six Architect specializations and preface the sub-specializations with the parent specialization, for example, IT Architecture – Application Architecture, or sometimes, just Application Architecture, as a shortened version.



Specializations represent focal areas of best practices and development guidance for Architects. Each specialization:

- Represents bodies of related knowledge and experience
- Covers an aspect of the Architect's work
- Encompasses a population of Architects with related job roles
- Is represented by a worldwide advisory body
- Defines its own set of capability themes and statements

As defined in the profession, specializations represent focal areas of best practices and skill development guidance for Architects. Each specialization represents bodies of related knowledge and experience. The capabilities in a specialization tend to complement one another.

In addition, each specialization covers an aspect of the Architect's work, encompasses a population of Architects with related job roles and professional interests, and is represented by a worldwide advisory body, the Specialization Management Team, which ensures the vitality of its knowledge domain. Each specialization defines its own set of capability themes and statements.



- Architects are required to declare a specialization when they are applying for certification (Defining Architectures, Expert level validation).

Early career Architects are not expected to gain enough experience to be able to declare a specialization. Therefore, specialization capabilities are only validated when Architects apply for certification. In terms of Career Framework, this is the Expert level in the Defining Architectures capability. When applying for certification, you must declare a specialization.



- Architects are required to declare a specialization when they are applying for certification (Defining Architectures, Expert level validation).
- They must provide evidence that they met the capabilities associated with their declared specialization.

You must provide evidence that you met the capabilities associated with your declared specialization. You will learn more about the specialization capabilities later in this module.



- Architects are required to declare a specialization when they are applying for certification (Defining Architectures, Expert level validation).
 - They must provide evidence that they met the capabilities associated with their declared specialization.
- Certified and Senior Certified Architects can change specialization at the time of revalidation.

If you are Certified or Senior Certified, you can change the specialization at the time when you revalidate. You will need to provide evidence that you have the training, skills, and experience in the new specialization.



- Architects are required to declare a specialization when they are applying for certification (Defining Architectures, Expert level validation).
 - They must provide evidence that they met the capabilities associated with their declared specialization.
 - Certified and Senior Certified Architects can change specialization at the time of revalidation.
- Certified Architects can also change specializations when they apply for Senior Certification.

For Certified Architects, you can also change specializations when you apply for Senior Certification. You will need to meet the same additional requirements as the specialization change candidates at revalidation.

Module Outline



- Introduction and Objectives
- What are Architect specializations?
- ▶ **Business Architecture**
- Enterprise Architecture
- IT Architecture – Application Architecture
- IT Architecture – Information Architecture
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The first specialization we will discuss is also the newest, which is Business Architecture.



Defines the structure of an enterprise in the context of the business intent of that enterprise

Does so in terms of capabilities, governance structure, business processes, business information, roles, KPIs, locations, events, and other key enabling aspects

Business Architects:

- Maintain a holistic view of the enterprise even when working on efforts for only a part of the business or organization
- Translate strategy into implications for operations, governance, and enabling technology
- Focus on the end-to-end linkages between strategy, business, and IT
- Create mainly logical assets and models
- Support decision makers
- Design and align business and IT enablers to meet business intent

Business Architecture defines the structure of an enterprise in the context of the business intent of that enterprise. It is represented in terms of capabilities, business governance structure, business processes, business organization, business information, roles, KPIs, locations, events, and other business enablers.

These business enablers help define, describe, and elaborate representations such as how the fundamental aspects of a business are organized or how its business constructs are configured; the business models, building blocks, patterns, and principles that describe a business; and the "who, what, when, where, and how" of a business.

Business Architects maintain a holistic view of the enterprise even when working on efforts for only for a part of the business or organization. They work across as well as within enterprise processes and transformation initiatives and reach out into the wider ecosystem within which an enterprise operates.

They translate their holistic understanding of the business direction, context, and strategies into implications for operations, governance, and enabling technology. They focus on the end-to-end linkages between strategy, business, and IT. This differentiates the Business Architect from neighboring roles like the Business Consultant, Enterprise Architect, or Business Analyst that have a more siloed primary focus. Business Architects create mainly logical assets and models.

They support decision-makers for optimizing their operations and refining or transforming their strategy. They provide the structure and process for designing and aligning business and IT enablers to deliver both strategic and operational intent.



Six capabilities have been defined for Business Architecture:

- Analyze Business Design
- Design Strategic Capabilities Model
- Model the Business
- Analyze Business Structure and Processes
- Perform Business Architecture Gap Analysis
- Support Business Architecture Transition Plan

The six capabilities address different aspects of a Business Architect's work: Analyze Business Design, Design Strategic Capabilities Model, Model the Business, Analyze Business Structure and Processes, Perform Business Architecture Gap Analysis, and Support Business Architecture Transition Plan.

You can find the descriptions of these capabilities in the final module of this course. Please note that, while it is not a definitive capability, a valuable skill for being successful in a Business Architect role is an awareness of the culture of the organization. An enterprise has varying and often differing values and behaviors within its key business units, such as IT or Operations.

Because Business Architects must bridge and link strategy to operations, governance, and enabling technology, they should be alert to and watch for these attitudes, beliefs, and sometimes unwritten rules that define the divisions within an enterprise. By doing this, a Business Architect will be better able to utilize their capabilities to drive commitment within the enterprise and enable the Business Architect as a successful agent of change.



Experience may result from engagements at the enterprise level as well as at the solution level.

Business Architect capabilities define the formal experiences required. Other important aspects are:

- Apply systems thinking techniques
- Use knowledge of the client's business and industry
- Design business patterns
- Architect business solutions
- Governance that exploits the value of business architecture

Business Architects can gain experience from engagements that are at the enterprise level as well as the solution level. Business Architecture capabilities that we just discussed define the formal experiences required for this specialization.

There are other important experiences that Business Architects should have:

- The ability to apply system thinking techniques is very important.
- Business Architects need deep knowledge of the client's business and industry to be able to translate the business strategy into operations.

In addition, they should have experience designing business patterns and architecting business solutions. Finally, the implementation of governance processes is crucial to the successful implementation of a Business Architecture.



Business Architects typically work on the following types of projects:

- Business Architecture development or assessment for an enterprise, a business domain, or a solution
- Strategy and Transformation, BTO
- M&A planning and post M&A implementation
- Business Value Assessment (BVA)
- Actionable Business Architecture (ABA)
- Component business modeling (CBM)
- CBM SOMA
- Business-driven development of software engineering
- Business process management, reengineering or innovation, or business performance and service optimization (BPSO)
- Enterprise-level IT renovation
- EA/SOA governance assessment, planning, definition, and enablement
- Requirements management
- Major application innovation projects

As shown in the representative list here, projects for Business Architects are many and varied. They include business architecture development or assessment for an enterprise, business domain, or solution. They could be strategy and transformation projects, BTO, M&A, business value assessments, actionable business architecture, component business modeling, Service Oriented Modeling and Architecture (SOMA), or any of the other areas and project types shown.



Why do Architects choose Business Architecture?

- ➡ Business Architecture creates results not reached by other means.

Why do Architects choose Business Architecture? Architecting the business is a discipline and technique that creates results that the business cannot reach by other means.

Creating structures (architectures) for the--so far--relatively unstructured business makes the business and overall business strategy accessible to the analysis, modeling, and optimization techniques developed for use by more structured areas like IT.

Further, in creating these structures, it further reduces the business context misinterpretations and drives results through accuracy and business appropriateness not realized solely in requirements and use cases.



Why do Architects choose Business Architecture?

- Business Architecture creates results not reached by other means.
- It provides creative work with significant responsibility.

Architecting the business is a creative work with a large responsibility. Architecting the business also means helping shape the business. The business vision and intent are given by the customer, but the Business Architect shapes HOW the business is done and HOW it is supported by IT.

Although it may sound very dry, this is often creative work, and it carries a large responsibility to help enterprises to focus on successfully driving transformation, innovation, and business results.



Why do Architects choose Business Architecture?

- Business Architecture creates results not reached by other means.
 - It provides creative work with significant responsibility.
- It bridges and translates business (intent) to (IT) architecture.

Bridging or translating from business (intent) to (IT) architecture: Structuring the representation of the business is a way to make the translation from business intent to IT solutions understandable for both parties. It reduces misunderstandings and makes communication between business and IT easier, more exact, and more impactful over time.



Nicola Stein

- Insurance industry, IBM GBS, Germany.
- Consulting engagements at the enterprise level
- Lead architect in Core Insurance solution projects
- I lead:
 - Business area Core Insurance in GBS Insurance Germany
 - Worldwide Business Architect Specialization Management Team



Senior Certified Architect
Business Architect
GBS
Germany

Nicola Stein is a certified business architect in Germany. Here is what she has to say about being a business architect:

My name is Nicola Stein. I am a Business Architect for the insurance industry in IBM GBS in Germany. I work in consulting engagements at the enterprise level or as lead architect in Core Insurance solution projects. I lead the business area Core Insurance in GBS Insurance Germany and the worldwide Business Architect Specialization Management Team.



Nicola's career path

- Started out as a data modeler and software developer
- In the early 1990s: IBM's Insurance Application Architecture, IAA
- Business Architect role did not exist at the time
- Initially certified as Application Architect
- Thought Leader in the Providing Insurance Industry Insight Capability
- Business Architect – a bridging role between business and IT
- Additional skills helpful



Senior Certified Architect
Business Architect
GBS
Germany

I started out as a data modeler and software developer and evolved into application architecture. In the early nineties, I became fascinated by IBM's insurance industry model, the Insurance Application Architecture, the IAA. By adopting and amending IAA and by engaging in insurance product modeling, I grew insurance industry insight. The use of IAA and product modeling often took my engagements to an enterprise level.

My love for translating from an unstructured business intent into a structured IT solution and for ensuring the business consistency of a solution let me take up a role that we call a Business Architect today, although the role did not exist at the time.

I initially certified as Application Architect, and I am a Thought Leader in the Providing Insurance Industry Insight Capability. As the Business Architect is a bridging role between business and IT, it is a good addition to have a foothold on one or both sides of the bridge.



Nicola describes methods and technologies

- There is not just one IBM business architecture method.
- IBM's UMF supports CBM, BPM, SOMA, CMBSOMA, and Business Architecture Quickstart.
- Business Architects working at the project level cover parts of the UMF application innovation process family.
- Industry models, like IBM Insurance Application Architecture (IAA) are valuable assets for the Business Architect.



Senior Certified Architect
Business Architect
GBS
Germany

There is not the one IBM business architecture method. IBM's UMF contains several delivery processes supporting different business architecture engagements, for example, CBM, BPM, SOMA, CMBSOMA, or the Business Architecture Quickstart.

Business Architects working at the project level cover parts of the UMF application innovation process family. Industry models, like IBM Insurance Application Architecture (IAA), are valuable assets for the Business Architect.



Nicola describes a typical project

- From consulting on business design to application innovation
- BA still an emerging concept for many customers
- Enterprise-level engagement: Definition of SOA governance, technical reference architecture, and business architecture for a financial services provider



Senior Certified Architect
Business Architect
GBS
Germany

There are very different kinds of Business Architecture engagements. They reach from consulting on business design to application innovation projects. Business Architecture is still an emerging concept for many customers. Some adopt it top-down from the enterprise level, others bottom-up from the project level.

An example of an enterprise-level engagement was the definition of SOA governance, technical reference architecture, and business architecture for a financial services provider. I used IBM IAA as the business reference architecture.



Nicola describes a solution-level engagement.

- Large core insurance custom application development project
- Customer tried Business Architect role for the first time
- Was the Lead Architect and coached the future customer BA
- Implemented a business architectural decisions process and defined business components with business services as a base for the IT component model and system integration decisions
- Adopted both for the enterprise level later



Senior Certified Architect
Business Architect
GBS
Germany

An example of a project-level engagement was a large core insurance custom application development project. The customer tried out a Business Architect role in this project for the first time. I had an operational role as lead architect and coached the future customer Business Architect in business modeling.

I implemented a business architectural decisions process and defined business components with business services as a base for the IT component model and system integration decisions. I adopted both for the enterprise level later.

Module Outline



- Introduction and Objectives
- What are Architect specializations?
- Business Architecture
- ▶ **Enterprise Architecture**
 - IT Architecture – Application Architecture
 - IT Architecture – Information Architecture
 - IT Architecture – Integration Architecture
 - IT Architecture – Technology Architecture
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 - Summary

Next, we will discuss Enterprise Architecture.



Enterprise Architecture is concerned with defining the enterprise frameworks, models, mechanisms, and structures so that:

- The business, information system, and technology capability of an enterprise evolves to support the business strategy or intent
- The many individual initiatives are guided or constrained to reduce fragmentation and variation

Enterprise Architects:

- Focus on the common building blocks
- Integrate the building blocks to design a systems blueprint for the enterprise
- Establish architecture and governance frameworks
- Contribute to other architectural domains

Enterprise Architecture is concerned with defining the enterprise frameworks, models, mechanisms, and structures so that the business, information system, and technology capability of an enterprise evolve in a manner that effectively supports the business strategy or intent.

This includes assisting enterprises to plan and prioritize initiatives that optimize business and IT investments. The many individual initiatives that deliver solutions are guided or constrained in a manner that reduces the fragmentation and variation that are the natural result of business units or groups delivering solutions in an autonomous manner.

Enterprise Architects are focused on the common building blocks; they integrate these building blocks to design a system blueprint for the entire enterprise. They also establish architecture and governance frameworks, as well as contribute to the other architectural domains.



Six capabilities have been defined for Enterprise Architecture:

- Strategic (Business-IT) Alignment
- Enterprise Architecture (EA) Development
- Enterprise Architecture Models
- Architecture Gap Analysis
- Architecture Transition Plan
- Architecture Governance

The six capabilities defined for Enterprise Architecture are Strategic (Business-IT) Alignment, Enterprise Architecture (EA) Development, Enterprise Architecture Models, Architecture Gap Analysis, Architecture Transition, and Architecture Governance. You can find the descriptions in the final module of this course.



Enterprise Architects should focus on both breadth and depth.

- EA covers both strategic and technical capabilities
- High-level exposure to the primary EA domains:
 - Business Architecture
 - Application Architecture
 - Information Architecture
 - Technical Architecture
 - EA Governance
 - EA Project Management
- Detailed understanding and experience of at least one architecture domain and its components.

An Enterprise Architect contributes to each of the architectural domains – these include Business Architecture, IS Architecture (that is Application and IT Information Architectures), Technology Architecture, as well as governance structures and mechanisms needed to maintain the relevance and effectiveness of the Enterprise Architecture.

Enterprise Architects should gain experience in the EA domains; they should get a high level exposure to all of them, so that they understand how these domains relate to one another. Enterprise Architects should also have detailed understanding of at least one architecture domain and its various components, known as architectural building blocks (ABBs). For example, Technical Architecture may include dozens of ABBs, including networks, security, systems management, platforms, and so on.



Enterprise Architects typically work on several types of projects as a lead architect or member of the broader Enterprise Architecture team.

- Enterprise architecture development
- Enterprise architecture assessments
- Enterprise architecture gap analysis
- Enterprise architecture transition planning
- Enterprise architecture governance and processes
- Enterprise architecture vision and principles workshops
- Business Architecture/CBM/CBM-BoiT/ Business Process Modeling
- Application architecture design
- Data/IT information architecture design/business intelligence
- Technical architecture strategy or roadmaps
- Project management

Enterprise Architects typically work on several types of projects as a lead architect or member of the broader Enterprise Architecture team. Some of these projects are enterprise-specific, such as Enterprise Architecture development, assessment, gap analysis, transition planning, governance and process, and vision and principles workshops.

Enterprise Architects frequently work in the other domains. For example, in the Business Architecture space, they may be engaged in projects that are involved with component business modeling (CBM) for the business of IT, or Business Process Modeling. They may lead in application architecture design, data/IT information architecture design or business intelligence, or technical architecture strategy or roadmaps.



Why do Architects choose Enterprise Architecture?

- Develop IT strategies and roadmaps aligned to business goals and objectives in support of an enterprise's long-term business strategy
- Assist CXO to establish IT plan and strategy to implement business transformation and optimization initiatives
- Take a comprehensive, panoramic view of business and IS architecture across an enterprise
- Interested in all domains of architecture - Business, Application, Information, and Technical Architecture, and their integration

Why do Architects choose Enterprise Architecture? Because they like to develop IT strategies and roadmaps aligned to business goals and objectives in support of an enterprise's long-term business strategy.

They want to assist the CXO in establishing an IT plan and strategy to implement business transformation and optimization initiatives. They excel in taking a comprehensive, panoramic view of business and IS architecture across an enterprise.

They are interested in all domains of architecture - Business, Application, Information, and Technical Architecture, and their integration.



Jane Chen

- Senior Certified Enterprise Architect
- Client Technical Advisor on the BHP Billiton Integrated Account.
- Worked in GBS as an Enterprise Architect
- Jane's career path
- Learned Ernst & Young's method on business and enterprise architecture
- Pursued architecture-related roles and assignments
- Transitioned naturally into IBM as an Enterprise Architect



Senior Certified Architect
Client Technical Advisor
S&D
Australia

Jane Chen is a senior certified enterprise architect in the role of Client Technical Advisor on the BHP Billiton Integrated Account in Australia. Prior to joining S&D Jane worked in GBS as an Enterprise Architect with Telco, Insurance and Finance organizations.

Jane became interested in Enterprise Architecture early on in her career when she was working with Ernst & Young. Jane was exposed to their method on business and enterprise architecture which she resonated with and found very interesting. She pursued roles and assignments that were architectural in nature and made during her time with Ernst & Young and Coles Myer Ltd. This led to the natural transition into IBM as an Enterprise Architect.



Methods and technologies:

- EA Consulting Method
- IBM's Unified Method Framework
- The Open Group Architecture Framework
- Rational Systems Architect

Typical EA projects:

- Variable depending on client needs
- Establishing EA capability and governance
- Developing EA work products as a foundation to their strategy and roadmap efforts



Senior Certified Architect
Client Technical Advisor
S&D
Australia

The EA Consulting Method is a key method that is used on enterprise architecture engagements. IBM's Unified Method Framework is also used. More and more of our clients are adopting The Open Group Architecture Framework and expect IBM Enterprise Architects to be familiar in its adoption.

Rational Systems Architect is a very good tool and repository for Enterprise Architecture work products. It is particularly useful to fast track development of an integrated set of EA work products.

EA engagements vary depending on the needs of the client, and it is not typical for a client to request a full EA project. Recent typical projects involve establishing EA capability and governance. As a result of business transformation initiatives, clients are also seeking assistance with developing EA work products as a foundation to their strategy and roadmap efforts.

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The next topic is the Application Architecture sub-specialization under IT Architecture.



Application Architecture is concerned with designing solutions that are required to automate business processes and meet business needs.

Application Architects:

- Design applications that:
 - Meet defined functional and nonfunctional requirements
 - May run on multiple platforms
 - Include several software packages and custom components
- Perform evaluation and selection of components, development methods, and tools
- Lead requirements capture and composition
- Design or reuse/customize both process and information aspects of the application
- Guide and support end-to-end realization of the solution for delivery

Architects specializing in Application Architecture design solutions that are required to automate business processes and meet business needs. They design applications that meet the defined functional and nonfunctional requirements.

The applications may run on more than one platform, and that might be composed of several software packages and custom components. They perform critical evaluation and selection of the software and hardware components required by the application and data. They prepare for the development of the application by leading the evaluation and selection of development methods and tools.

In the early phase of the project, they lead requirements capture and composition. Based on the requirements, they then design, reuse, or customize both the process and information aspects of the application. Frequently, the Application Architects will continue to provide guidance and support all the way through to the delivery of the solution.



Six capabilities have been defined for Application Architecture:

- Functional View Development
- Elaborating the Functional View for Service Quality
- Reflection on Operational Modeling
- Application of Different Development Approaches
- Test Architecture
- Incremental Delivery

The six capabilities defined for Application Architecture are Functional View Development, Elaborating the Functional View for Service Quality, Reflection on Operational Modeling, Application of Different Development Approaches, Test Architecture, and Incremental Delivery. Descriptions of these capabilities are provided in the last module of this course.



- Application Architects have a breadth of experience:
 - Multiple development methods and tools
 - Multiple architecture styles
 - Multiple technologies
 - Multiple application aspects (process, information, interaction, ...)
 - Multiple architectural patterns
 - Multiple component providers
- They must have detailed knowledge in at least one industry and often act as coordinators between business teams and implementation/testing teams.
- Application Architects provide skills in industry solutions and solution technologies that are essential for successful application realization and customer satisfaction.

Successful Application Architects have a breadth of experience. They have multiple experiences in the area of methods and tools, architecture styles, technologies, and application aspects such as process, information, interaction, and so on. They also have experience with various architectural patterns and component providers.

Typically, Application Architects have detailed knowledge in at least one industry and often act as coordinators between business teams and implementation or testing teams. They provide their expertise in industry solutions and solution technologies that are essential for successful application realization and customer satisfaction.



Application Architects typically work on several types of projects:

- Custom application development
- Application package selection
- Application integration
- Application enhancement
- SOA enablement/development
- SOA governance
- Application portfolio assessment
- Business transformation and application reengineering
- Product/asset development

The slide lists some of the typical projects that engage Application Architects. The projects that involve application development, integration, enhancement, and package selection are obvious. Some projects, such as SOA governance, application portfolio assessment, business transformation and application reengineering, and product and asset developments, often employ Application Architects, as well..



Why do Architects choose Application Architecture?

- Run complex projects with a large set of interrelated functional and nonfunctional requirements
- Meet challenge of custom application development in multiple build cycles (releases)
- Interest in combining custom application development with packaged applications
- Extend skills to achieve business/IT alignment
- Transform business goals and strategies into IT architecture

Why do Architects choose Application Architecture?

- They want to run complex projects with a large set of interrelated functional and nonfunctional requirements.
- They need the challenge of custom application development in multiple build cycles (releases).
- They are interested in combining custom application development with packaged applications and their integration into a viable business solution.
- They want to extend both their industry skills and their method and technical skills to achieve business and IT alignment.
- They aim at transforming business goals and strategies into IT architecture, applying suitable or novel methods and tools.



Rainer Gimnich

- Senior Certified Architect in the IOT NE Information Agenda Tiger Team, SWG.
- Runs consulting engagements in Banking
- Runs workshops:
 - Solution workshops
 - Roadmap workshops
 - Governance workshops
- ...for business departments



Senior Certified Architect
Information Agenda
Architect
Executive Architect
Software Group
Germany

Ranier Gimnich, a senior certified architect in Germany, shares with us his personal experiences in application architecture.

Hello. My name is Rainer Gimnich. I am an Architect in IBM Software Group, an Application Architect, Senior Certified, and I am working in the IOT NE Information Agenda Tiger Team, in Software Group. My job is currently running consulting engagements in the banking sector.

And, as an Application Architect, I run several workshop types. I run solution workshops, giving the architecture an overall solution to the customer in a relatively short time. I am doing roadmap workshops, which are typically longer--3, 4, or 6 weeks. And I am doing governance workshops with the client, all in the interest of moving high-end products; that is, information management products, content management products, and business analytic products, into the customer's environment.

And the way we do this is by defining suitable solution architectures that are attractive to the client so that the client wants to realize those solutions on the basis of our products. So, this is my main job. And I am keen to run such workshops in the business departments rather than in the IT departments, where we get access to the business people, to the experts. We will talk to them, and in this way leverage our chance of selling. Apart from doing workshops, I also provide assets to the team, intellectual property, and I also define and work with the customer in order to get published client references.



Rainer Gimnich - Career Path

- Started in SWG, Boeblingen, banking projects
- Five years ago, SOA projects, legacy transformation
- One year ago, Information Agenda team



Senior Certified Architect
Information Agenda
Architect
Executive Architect
Software Group
Germany

So briefly, my career path. I started in Software Group, in the German lab in Boeblingen, and later worked in GBS on several large banking projects, including huge projects around moving from the local currency to the euro currency, which was quite popular in Europe some years ago.

So this was a very complex environment that we had to do, eliminating the local currency in the existing applications. About five years ago, I moved to Software Group to concentrate on SOA projects, building SOA assets, working on SOA methods, and also supporting Product Development, but all of this was done with customers.

So every project was largely a legacy transformation project because there is always a huge legacy base in the customer environment, sources of COBOL, PL1, and assembler, and often mainframe environments, and SOA is an architecture that is built on top of existing assets. About one year ago, I started my work in the Information Agenda team that I mentioned before. I would now like to go to the next page and talk a little bit about methods and technologies that I used.



Methods and technologies

- GSMethod, UMF, mostly for Custom Application Development engagements
- TeamSD subset on the Information Agenda team
- Other methods such as SE&A, V-Model, and SOA design methods (CBM, SOMA)
- Tools include Rational Software Architect, SOMA-ME; WebSphere Business Modeler, CBM tool.



Senior Certified Architect
Information Agenda
Architect
Executive Architect
Software Group
Germany

For me, as an Application Architect, methods are suitable and useful vehicles, so I use them from the beginning to a large extent in order to reduce the risks in projects, in order to get guidance on how the next project can be done, and also in order to use assets, that is, existing work products that can be reused and adapted to new environments.

So, I mostly use GSMethod, or now the UMF, Unified Method Framework, and mostly also for customer application development, as an Application Architect. And Team solution design, which to me is a subset of our overall methodology, is what I mostly use now in the Information Agenda team. This is a very useful way of communicating with other teams within IBM, with other LOBs, with the services teams, and also with STG. It has proven to be a helpful method environment.

On some projects, I have also run some additional methods. For example, in government projects in Europe, we often need to map to the V-Model, which is their waterfall method, which is not easy to map from UMF, but this is often a requirement in the government industry, so we need to adapt to that. I have also run work products in the Systems Engineering and Architecture method, SE&A--especially the review structure that can be used from this method--has proven helpful in traditional projects, as well.

And, of course, also in the SOA projects, I have used specific methods such as CBM (component business modeling) and SOMA (service-oriented modeling and architecture), and also the related tools for these. This was very important in huge transformation projects, for example, with the Austrian government, which was a long-term SOA transformation project where we used all of those methods and also, specifically, the SOA methods and the tooling, with Rational Software Architect and with WebSphere® Business Modeler, and the plug-ins for SOMA and the CBM tool. This was a very helpful experience to also be able to extend those methods, to extend the tools, to get feedback from the developer, and, in the team, to be able to improve our overall method and tool set.



Rainer Gimnich describes a typical project

- Current project: Attach SAP Web services to an existing environment (CICS®-based)
- Trying to retain the safe transactional behavior for the end-to-end solution



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Software Group
Germany

So maybe a few words on my current project that I am working on... With a major German bank, I am running a project on attaching SAP Web services to an existing long-term environment, which is CICS-based, so it is typical transaction processing for cards management, for cards usage, for example, at an ATM or post terminals.

Part of this process is replaced by the SAP banking package, and it's a challenging environment here to be able to split the existing transactions in the current legacy applications and be able to place SAP services calls into these applications and still retain the overall transactional capability.

This is not easy to achieve because here two very different architectures come together and need to be combined. The whole thing must be safe, because otherwise there would be a lot of exposure on the part of withdrawal by the customer. So, this is a very challenging environment that requires a lot of experience and insight; also, in terms of nonfunctional requirements that need to be met, and complex test conditions that need to be defined, and everything must be tested up front very thoroughly in order to achieve a safe and viable solution. Thank you.



- Introduction and Objectives
- What are Architect specializations?
- Business Architecture
- Enterprise Architecture
- IT Architecture – Application Architecture
- ▶ **IT Architecture – Information Architecture**
- IT Architecture – Integration Architecture
- IT Architecture – Technology Architecture
- Applying Capabilities from Multiple Specializations
- Summary

The next topic is the Information Architecture sub-specialization under IT Architecture.



Information Architecture is focused on the elements required to structure the information and data aspects of solutions.

Information Architects get involved at all levels of Information Management:

- Developing the information strategy and information governance
- Designing information models at both logical and physical levels
- Delivering information systems to business users from the board room to the coal face to support information exploitation at all levels of the organization
- Designing and delivering information flow across the solution architecture from operational sources through to reports delivered on a PDA

Architects specializing in Information Architecture focus on all aspects of information and data. In IT, the words “information” and “data” tend to be used interchangeably, but strictly speaking, there is a difference.

“Data” refers to the raw input of numbers, characters, symbols, or images that when processed or arranged makes meaningful output – information. Information Architects are concerned with all aspects of information from delivering a strategy or a governance framework to designing information stores at the physical level.

They are concerned with where the information is coming from (the source), how it will be extracted, transformed, and loaded into the information stores, and how it will be exploited by the business users.



Six capabilities have been defined for Information Architecture:

- Information System Architecture Design
- Information Modeling
- Information Integration
- Information Sharing and Re-use
- Information Exploitation
- Metadata Strategy Design and Implementation

The capabilities cover the full range of skills expected of an Information Architect: Information System Architecture Design, Information Modeling, Information Integration, Information Sharing and Re-use, Information Exploitation, and Metadata Strategy Design and Implementation. Descriptions of the capabilities are in the final module of this course.



Information Architects will have a technical background in one or more of the following:

- Database design and management
- File systems and storage management
- Document imaging and document management
- Knowledge and content management
- Analytics and statistical tooling
- Typical roles include:
 - Head of Information Architecture
 - Data Architect
 - Data Migration Lead
 - Chief Architect on business analytic and optimization project

Information Architects often start their IT careers in information management, for example, as a database administrator, data modeler, or document management specialist. Alternatively, they can develop their information architecture skills through being a data analyst understanding the data sources and the mapping to the target information model or working with the business users to drive out their reporting requirements.

Information Architects will be familiar with information system tools such as IBM Information Server for data integration or master data management products or analytic tools, such as Cognos® or SPSS.

Information Architects can take a variety of roles on a project, typically starting as a data architect or data migration lead, but then moving into more senior roles, such as the lead architect on a Business Analytics and Optimization project. The most senior Information Architects are in demand by IBM clients to head up Information Architecture teams and set the Information Architecture strategy as part of an Enterprise Architecture and Strategy organization.



Information Architects typically work on the following types of projects:

- Information Architecture strategy
- Business analytics and optimization strategy
- Enterprise information management solutions
- Enterprise content management solutions
- Business intelligence and performance management
- Advanced analytics and optimization
- Marketing systems
- Analytical and data components of operational systems
- Data migration and rationalization
- Knowledge management
- OLTP Systems - focusing on data management
- Master data management/global data synchronization/product information management
- Data harmonization within IT consolidation/M&A

On the operational side, Information Architects will work on the data management aspects typically leading the data architecture component or the data migration. Another key operational project that Information Architects get involved in is master data management. These types of MDM projects provide a single view of customer, product, or location to underpin a key business activity such as customer relationship management or the supply chain.

On the informational side, Information Architects will work on analytics and content management solutions across all parts of the business, for example, providing a financial consolidation and reporting functionality to support compliance reporting to government agencies or managing all the documentation and workflow around a customer taking out a new insurance policy. Data and information are everywhere, and businesses want to know everything from how the production line is running to what customers are saying about them out on the Internet.



Why do Architects choose Information Architecture?

- Fascinated by harnessing the information explosion
 - The challenge of making sense of the vast quantities of information that bombard us all every day
 - The challenge of turning data into information
- High degree of client collaboration at all levels of an organization
- Love to debate what a data item really represents and how to describe that data item
- Seeing the benefits of information exploitation
 - Driving competitive advantage
 - Higher levels of monitoring of premature babies in hospital
 - Improved crime detection rates
 - Reducing risk of failure in financial institutions
 - Improving the profitability of an organization
 - Getting great offers when logging into a favorite shopping website

Why do Architects choose Information Architecture?

- Because they are fascinated by the information explosion.
- Because they enjoy the challenge of making sense of the vast quantities of information that bombard us all every day.
- Because they enjoy the challenge of turning data into information.
- Because of the high degree of client collaboration at all levels from the finance director to the statistical analyst in the marketing department.
- Because they love debating what a data item really represents and how to describe that data item.
- Because the benefits of information exploitation are tremendous, for example: Higher levels of monitoring of premature babies in hospitals, improved crime detection rates, reducing risk of failure in financial institutions, improving the profitability of an organization, and getting great offers when logging into a favorite shopping website.



Sue Forder's career path:

- First, a trainer and then SQL and 4GL Developer
- Sequent – data warehousing
- Sequent purchased by IBM
- Now in GBS, Business Analytics and Optimization



Senior Certified Architect
Senior Managing
Consultant
Executive Information
Architect
GBS
UK

Sue Forder, an Executive Information Architect in the United Kingdom, shares her experiences with us now.

My career path: I started in IT with a relational database company called Ingres, and I started as a trainer because I had previously been a classroom teacher. This gave me a great grounding in database technology and an understanding of how databases were used.

Within the same company, I moved from being a trainer to being a consultant, where I did hands-on development in both SQL report writing and 4GL. From Ingres, I moved to another company called Sequent, which was a hardware company. Sequent had recognized that in order to sell hardware, you needed to have applications and business requirements. And Sequent got into data warehousing very early on, back in 1995, and I was lucky enough to get involved in that emerging offering and development of some of the first data warehouses in the UK.

This allowed me to move from being a technical specialist into being a data architect and, if you like, moving from development to design. I stayed in that company until 2000, when Sequent was bought by IBM. I then moved from Sequent into IBM consulting, and I am now in GBS in the Business Analytics and Optimization practice. Initially, I focused on simple data warehouses, doing the solution architecture for data warehouses, but more recently, I have moved into more projects that do information architecture and information strategy. So, I am moving up the stack.



Methods and technologies

- Information Architects must have:
 - Strong background in data
 - Passion for understanding data
 - Familiarity with tooling
 - Familiarity with database management systems



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Architect
GBS
UK

Methods and technologies: The key to being a good Information Architect is to have a strong background in data, an appreciation of data, where it comes from, how it is modeled, who needs it, and how it gets used. That background could be from a database background like me or, actually, you could come from more of an unstructured information background, perhaps around content management or document management.

The key is to be passionate about understanding the information and the data and the background, experience, and ability to design – database design or document management design – and also familiarization with the tooling that is required to manage information; that is, the tooling to take data out of source systems and then put it into information systems such as extract, transform, and load technology, such as our own IBM information server.

Also, you must be familiar with database management systems such as, of course, DB2® or potentially our newer product, Netezza or, of course, the information access tools, such as Cognos or SPSS.



Sue Forder describes a typical project

- Insurance company – compliance reporting
- Requires an end-to-end solution
- Architect involved at pre-sales and at delivery
 - High-level solution description for proposal
 - Resource estimates
 - Macro design
 - Micro design, test, follow-through



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UK

Let me describe a typical project. The current project I am working on is with an insurance company around compliance reporting, which is a new European directive, known as Solvency II.

This directive requires insurance companies to demonstrate, through quarterly reporting, how they are managing their capital reserves. It requires an end-to-end solution, taking the data from the line of business systems at the level of detail required for this new reporting, building a data warehouse of that line of business solutions, and then building downstream interfaces into business applications where that data is manipulated and modeled by actuaries and finance departments.

This is a good example of a project where I have worked for both pre-sales and the delivery. And this is quite often the case, that I will get involved in the pre-sales, shape the solution at a high level so it can go into the proposal, make sure that it's practical and meets the business requirements, and also can get built at a good cost for both IBM and the client.

I also typically get involved in the resource estimates – how many people are required to build this solution – and that would go into the proposal. Then, the next step is the high-level design, the macro design, where I will produce the Architecture Overview, the Component Model, and drive out the key architectural decisions around technology selection, design patterns, and information placement. And then, if I am involved in the full end-to-end, I will move into micro design and build and test, and see the project through to completion.

Module Outline



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The next topic is the Integration Architecture sub-specialization under IT Architecture.



Integration Architecture is concerned with designing solutions that enable new and existing components, applications, packages, and systems to work together within an enterprise or among enterprises.

Integration Architects:

- Use their knowledge of differing technologies, vendors, platforms, and styles of computing
- Focus on solutions that integrate and collaborate with existing IT systems
- Maintain a holistic view of enterprise solutions

Integration Architecture is concerned with designing solutions that enable new and existing components, applications, packages, and systems to work together within an enterprise or among enterprises.

Architects specializing in Integration Architecture use their knowledge of differing technologies, vendors, platforms, and styles of computing to design solutions that enable new and existing components, applications, packages, and systems to work together within an enterprise or among enterprises.

Their primary focus is on developing solutions that fully integrate and collaborate with existing IT systems to perform an automated business function. They maintain a holistic view of enterprise solutions, taking into consideration operational costs, security, performance engineering, application development, and systems management.



Six specialization aspects have been defined for Integration Architecture:

- Access Integration
- Process Integration
- Quality of Service (QoS)
- Components and Services Placement
- Component Integration
- Data Integration

Six capability areas have been defined for the IT Architecture-Integration Architecture specialization. These capabilities reflect the Integration Architect's need for broad experience that encompasses aspects of other specialization areas, as well as aspects unique to the Integration Architect.

The capabilities are: Access Integration, Process Integration, Quality of Service (QoS), Components and Services Placement, Component Integration, and Data Integration. Descriptions of these capabilities are in the final module of this course.



Integration Architects must have both breadth and depth.

- High-level exposure to the primary Integration Architecture domains:

The Integration Architect does not focus on one specialized area of architecture, such as Information Architecture or Application Architecture. Instead, Integration Architects' responsibility is to the holistic solution that spans those areas of specialization.

As such, successful Integration Architects must have both breadth of experience across multiple Integration Architecture domains, as well as depth of experience in one or more of those domains.



Integration Architects must have both breadth and depth.

- High-level exposure to the primary Integration Architecture domains:
 Business Architecture

For Business Architecture, Integration Architects should understand the linkage between business strategy and business operating models and the supporting IT strategy, IT architectures, and IT operating models.

This includes knowledge of concepts such as Component Business Modeling, Capabilities Modeling, Value Chain, and Business Process Modeling. Ideally, Integration Architects also have depth of experience in one industry and the models associated with that industry.



Integration Architects must have both breadth and depth.

- High-level exposure to the primary Integration Architecture domains:
 - Business Architecture
-  Access Integration

Access Integration is one of the six capability areas identified for the IT Architecture-Integration Architecture specialization, as mentioned on an earlier slide.



Integration Architects must have both breadth and depth.

- High-level exposure to the primary Integration Architecture domains:
 - Business Architecture
 - Access Integration
-  Application Integration

Application Integration is included in two of the six capability areas for the IT Architecture-Integration Architecture specialization: Component Integration and Process Integration.

Integration Architects should understand how to view applications as components within an overall solution. Also, Integration Architects should be familiar with Application Integration patterns (also called Process Integration patterns) and how they can be used to accelerate analysis of integration options and establishing a consistent approach to architecting solutions.

Integration Architects should understand the basic usage of Enterprise Service Bus, messaging, and connectors.



Integration Architects must have both breadth and depth.

- High-level exposure to the primary Integration Architecture domains:
 - Business Architecture
 - Access Integration
 - Application Integration
-  Extended Enterprise Integration

Extended Enterprise Integration is an extension of the Access Integration domain specific to integrating to customers and business partners outside the enterprise.

The Integration Architect should understand the special access and processing integration considerations that are introduced when extending business beyond an enterprise firewall. They should demonstrate awareness of supply chain, Internet, and public cloud implications.



Integration Architects must have both breadth and depth.

- High-level exposure to the primary Integration Architecture domains:
 - Business Architecture
 - Access Integration
 - Application Integration
 - Extended Enterprise Integration
- Process Integration

Process Integration is one of the six capability areas identified for the IT Architecture-Integration Architecture specialization. Note also the description of the Application Integration domain, which states that Process Integration patterns are also referred to as Application Integration patterns in some reference sources.

The Integration Architect should be able to discuss process automation concepts and extensions, including awareness of process modeling and optimization, human interaction, and Business Activity Monitoring (BAM) basics.



Integration Architects must have both breadth and depth.

- High-level exposure to the primary Integration Architecture domains:
 - Business Architecture
 - Access Integration
 - Application Integration
 - Extended Enterprise Integration
 - Process Integration
- Information Integration

Information Integration is one of the six capability areas identified for the IT Architecture-Integration Architecture specialization (see the previous slide).

The Integration Architect should be familiar with data integration patterns, including the basics of data federation, population, and synchronization. The Integration Architect should also know the basics of transactional data, operational data, data warehouses, data marts, and business intelligence.



Integration Architects must have both breadth and depth.

- High-level exposure to the primary Integration Architecture domains:
 - Business Architecture
 - Access Integration
 - Application Integration
 - Extended Enterprise Integration
 - Process Integration
 - Information Integration
-  Integration Architecture Governance

The Integration Architect should understand the basics of Integration Architecture Governance, including: architecture principles, policies, and guidelines; how to work effectively with architecture boards and roundtables; and architect roles and responsibilities within the solution delivery life cycle.



Integration Architects must have both breadth and depth.

- High-level exposure to the primary Integration Architecture domains:
 - Business Architecture
 - Access Integration
 - Application Integration
 - Extended Enterprise Integration
 - Process Integration
 - Information Integration
 - Integration Architecture Governance
- Depth includes a detailed understanding of at least one of the six Integration Architecture specialization aspects.

A well-rounded Integration Architect has real experience with project delivery through a full Architect delivery life cycle. This provides valuable knowledge of the Integration Architect's role, or lead role (which is the role that Integration Architects often play), as part of Project Management.

The Integration Architect should be able to describe how to structure and deliver an engagement involving Integration Architecture, and be able to cite some past "lessons learned" from such engagements



IT Integration Architects typically work on the following types of projects:

- IT Integration Architecture strategy
- Enterprise application integration
- Information Integration (Data Access Layer)
- B2B integration
- Vendor package integration
- OLTP Systems - focusing on integration and interfacing
- Business performance management
- Portal
- Process automation (Straight Through Processing)
- Business activity monitoring
- Legacy transformation

Integration Architects typically engage in complex projects that involve multiple components. Often, other Architects play a role according to their specialization – such as Application and Information Architects – and the Integration Architect is in a lead architect role, ensuring that the disparate aspects of the solution add up to the desired holistic target.

Often, the viability of the overall solution and its ultimate success rest on the skills of the Integration Architect. These projects vary greatly. Some Integration Architects are able to specialize in a particular solution type (such as computer/telephony Integration solutions), which enables them to develop skills in that area to a greater depth.

In addition to solution architecture and delivery, Integration Architects often assist Enterprise Architects to establish standards and best practices for enterprise integration. This may include assessments of current capabilities in operational efficiency or ease of access to business resources.



Why do Architects choose Integration Architecture?

- They like the challenge of assembling disparate parts into a whole.
- They like to think “outside the box” to envision how things could work.
- Every solution is different; every solution has its own challenges.
- They enjoy the art of finding the commonalities between different problems and their solutions.
- They are the “glue” that holds all of the pieces of a solution together.

Why do Architects choose Integration Architecture?

- Because they like the challenge of assembling disparate parts into a whole...kind of like a big puzzle.
- Because they like to think “outside the box” to envision how things could work...and then figure out the best way to make it so.
- Because every solution is different; every solution has its own challenges, ranging from technical to organizational/political, and financial.
- Because it is an art to find the commonalities between different problems and their solutions and apply that knowledge to design better, faster, and cheaper.
- Because Integration Architecture is the “glue” that holds all of the pieces of a solution together; without it, or without it done correctly, the solution will not succeed.



Karen Stanhope

- Client Technical Advisor - Hartford Insurance, CT
- WW Specialization Management Team Lead - Integration Architecture

Karen's career path

- Started in 1981 as a Systems Architect in POK, NY
- Spent time: HQ; Systems Engineer; Services; Software Sales



Senior Certified Architect
Client Technical Advisor
Executive Architect
S&D
United States

Karen Stanhope, a senior certified architect, shares her integration architecture experiences with us now.

Hello. This is Karen Stanhope, and I'm here to provide an overview to you of what it means to be an Integration Architect. Currently, I am an Executive IT Architect, and my position is Client Technical Advisor for the Hartford Insurance accounts.

I am also the Worldwide Specialization Management Team Lead for Integration Architecture. I have not always been in this position. I have been with IBM for 30 years as of 2010. I started in 1981 as a system architect in IBM's Quality Assurance Systems in Poughkeepsie, New York.

I spent two years in IBM headquarters and then moved "to the field" as a systems engineer. I also spent some time in IBM Global Services and in software sales, but in all of my jobs, I still basically performed architecture types of tasks.



Karen Stanhope describes her responsibilities

- Advises at the EA and Project level
- At times, takes a hands-on role in special-case strategic projects
- Actively assists, and usually leads, customers in establishing Enterprise Architecture strategies and roadmaps
- Uses industry models, best practices, IT frameworks, and patterns to help customers establish a sound foundation for business and IT decisions
- At the project level, uses structured methodologies to:
 - Identify business and IT requirements
 - Evaluate design alternatives
 - Architect solutions
 - Document design recommendations
 - Define required skills and tasks



Senior Certified Architect
Client Technical Advisor
Executive Architect
S&D
United States

I wanted to take you through a little bit about what the responsibility is for my job currently. Right now, as a Client Technical Advisor, I am responsible for working with the business and IT executives within the companies that I cover.

And again, that's the insurance companies in the Hartford, Connecticut area. I provide architecture guidance at the enterprise architecture as well as at the project level, usually early in what's called the "opportunity discovery" or early design stages. A big part of my role is opportunity identification. However, I sometimes take a hands-on role in certain strategic projects, meaning that I will actually dedicate some portion of my time as part of a project delivery team.

Most often, I play a lead architect role in these cases. Most customers consider me one of their employees, and they assign me strategic tasks for which I own primary responsibility. My responsibility to IBM is to use my influence to open the door for IBM Global Services, IBM Software Group, or IBM Hardware to engage with as much insight to the customer's drivers and value points as possible. Most of my time, however, is spent working with customers in establishing their enterprise and project architectures.

All of my work is grounded in requirements analysis at the business level, as opposed to taking a technology-forward lead. In the performance of those tasks, I use IBM assets, including industry models, patterns, and IBM methods and best practices. I'm a big advocate of the use of patterns in helping customers establish a sound foundation for their business and IT decisions.

At the project level, I use structured methodologies to identify the business and IT requirements, evaluate design alternatives, architect solutions, and document the design recommendations. I am also often asked to identify required skills and tasks for project delivery, which allows me to instill a competitive advantage for IBM in any RFPs that result (although I always try to head off an RFP through proactive IBM proposals).



Karen Stanhope describes a typical project

- Life insurers, property and casualty insurers - defining strategies and roadmaps
- Rapid roadmapping – leads customer through the identification of a strategy and road map
- Drive engagements with IBM Services and Software
- Need to understand how all systems need to integrate together to deliver the functional and nonfunctional requirements
- Worked on claims systems, transformation projects
- Created a large correspondence tracking/handling system
- Looks at projects holistically – makes sure that all parts work cohesively to deliver the business results



Senior Certified Architect
Client Technical Advisor
Executive Architect
S&D
United States

Some of the typical projects that I have worked on: I have been working most recently with major life and property and casualty insurers, helping them to establish their strategy and roadmaps in many different areas. I have created an approach that I call rapid roadmapping to accelerate the development of a high-level strategy and roadmap for a given domain.

In rapid roadmapping, I take a facilitator or thought leader role to work collaboratively with both the business and IT stakeholders. This approach is used judiciously in accounts where IBM is struggling to engage our services organizations. Often, I will perform the first Rapid Roadmap at no charge as an investment strategy, and once successful, re-engage for other domains with IBM Services or Software.

With one customer, this approach led to a GTS engagement for rapid roadmapping for six domains, which we completed in seven weeks. In this case, I was part of the engagement team. The customer is a reference account for this work, which they said would have taken them 72 weeks if they had followed their normal strategy process.

The success of this approach is grounded in understanding business requirements and leading the customer through a structured approach to understand the optimum strategy and a delivery roadmap for that. It leverages patterns and reference architectures to facilitate the analysis of systems that would be touched and how they would need to integrate together in order to deliver the business, functional, and nonfunctional requirements.

However, I don't just do rapid roadmapping. I have also led teams to help a customer to define a direct-to-consumer strategy, architect portals, claims systems, correspondence systems (one that is currently supporting more than 4 million documents per day), and even enterprise-wide transformation projects. That's what I like about being an Integration Architect – it seems that every project is different.

If I were to define what makes an Architect an Integration Architect, I would have to say that it is looking at the trees through the forest. You have to keep your eyes on the big picture, but not lose your attention to detail. Really, the job as an Integration Architect is to look at all the different parts and make sure that they work cohesively to deliver the results that the business is looking for.

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- Summary

The next topic is the Technology Architecture sub-specialization under IT Architecture.



Technology Architecture is focused on defining plans, strategies, and architectures for the installation, operation, migration, and management of complex information systems.

Technology Architects:

- Gather and analyze client IT needs
- Lead or advise teams that install, operate, and maintain IT systems
- Focus on the creation of strategic solution infrastructures

Architects specializing in Technology Architecture focus on the creation of strategic solution infrastructures for our customers' business applications. These strategic solutions are comprised of technology, service delivery processes, and organization design.

Technology Architects commonly define plans, strategies, and architectures for the installation, operation, migration, and management of complex information systems.

Gathering and analyzing client IT needs, Technology Architects translate these needs into requirements for specific systems management processes, products, and services. Often, Technology Architects are engaged to lead or advise the teams that install, operate, and maintain the IT system.



Five capabilities have been defined for Technology Architecture:

- Operational View Development
- Elaborating the Operational View for Service Quality
- Reflection on Functional Modeling
- Technology Elements Specifications
- Vendor and Product Selection

Technology Architecture is defined by five capabilities: Operational View Development, Elaborating the Operational View for Service Quality, Reflection on Functional Modeling, Technology Elements Specification, and Vendor and Product Selection.

You can find the description for each of these capabilities in the final module of this course.



Technology Architects' experience is primarily in:

- Technical assessment of IT technology architecture
- Development of IT technology architecture

Experience should extend through the design phases.

They should have some full-life cycle experience.

The experience of a Technology Architect is primarily in the area of technical assessments and development of IT technology architecture including server systems, storage systems, networks, and the operational aspects necessary to deliver and support them.

This experience should extend through the design phases. While not required for every project, it is important that an IT Technology Architect have full project life cycle experience, namely implementing the architectures, designs, and processes they developed.



IT Technology Architects typically work on the following types of projects:

- Infrastructure strategy
- Infrastructure assessment
- IT technology architecture
- Infrastructure design
- Infrastructure implementation
- Infrastructure sub-engagement in support of application development/implementation
- Technology refresh planning
- Infrastructure consolidation or virtualization
- Service management design

Technology Architects are involved in many varied types of engagements ranging from pre-sales infrastructure design for an application deployment through to designing a solution to improve the performance and response from the team, providing service management to an IT environment.

Technology Architects will often develop technology refresh plans and a technology strategy for a customer. They will also become involved in providing infrastructure assessments of existing systems and providing technology architecture for the enhancement or replacement of those systems.

Technology Architects may provide the technical leadership for large technology transformation engagements or they may be engaged to lead the technical design of a sub-component of a larger application design project.



Why do Architects choose Technology Architecture?

- They design and are involved with the physical implementation of an IT system.
- They work across all aspects of the design.
- Designing the technical aspect of an IT system is like building a jigsaw puzzle that has no edge pieces.
- The role is very challenging but also very rewarding.

Technology Architects get to design and be involved with the physical implementation of an IT system. They work across all aspects of the design, getting to understand the business problem from the customer, working with the application design teams to find out what their system will do, and then they get to design how it will actually be built.

Designing the technical aspect of an IT system is like building a jigsaw puzzle that has no edge pieces. You get all the pieces of the puzzle and only you know how it is all going to jumble together to form the picture that the customer had in their head. It is a very challenging role but very rewarding in the end to see what you designed actually turn on.



Steve Twist

- Software Client Architect
- IBM Software Group in Sydney, Australia
- Enterprise Architect for the Westpac Banking client



Senior Certified Architect
Software Client Architect
Software Group
Australia

Let's listen to Steve Twist, a senior certified Architect in Australia, as he shares his Technology architecture experience with us now.

Good day. My name is Steve Twist. I am a software client architect within the IBM Software Group in Sydney, Australia. I am an Enterprise Architect providing technical leadership and advice to the Westpac banking client on IBM software products. I am a trusted advisor to the client and to the other IBM brands within this integrated account.



Steve Twist's career path

- Lotus Notes® systems for Groupware
- Branched out to the Java® environments
- Leads large transition and transformation programs



Senior Certified Architect
Software Client Architect
Software Group
Australia

I started out my career as an Architect designing and implementing Lotus Notes systems, groupware, and messaging solutions for our customers. I branched out from there to Java environments and found that when designing these types of environments, I also had to consider infrastructure and technology, such as servers, storage, network, where to put it, and how to operate it when and if it stops working.

So with this broad technology background, it made it very easy for me to begin leading other engagements, which then allowed me to begin leading large transition and transformation programs within the IBM Company.



Steve Twist describes methods and technologies:

- IBM's Unified Method Framework
- Team Solution Design engagement model
- ITIL® framework
- Importance of the middleware layer above the traditional hardware stack
- SOA engagements – Message Bus and Business Processing
- Information Management and Business Analytics



Senior Certified Architect
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Let me talk a bit about some of the methods and technologies that a Technology Architect uses. Architects in my specialization use IBM's Unified Method Framework. We specifically use the Team Solution Design engagement model, which we use for any pre-sales engagements.

We rely a lot on the ITIL framework to define how operations teams will need to work with the IT systems. Technology Architects should really be familiar with middleware layers above the traditional hardware stack. Service-Oriented Architecture (SOA) engagements are driving extensive use of message bus and business process management.

In addition, information management and business analytics are also beginning to drive a number of technology decisions that we need to understand the base technologies to support going forward.



Steve Twist describes a typical project

- Design the infrastructure and operational aspects for the deployment of a new business application
- Inputs:
 - Statement of the business problem
 - Description of the application
- Tasks:
 - Gather nonfunctional requirements.
 - Create a view of the existing environment.
 - Define standards.
 - Find examples of a similar deployment.



Senior Certified Architect
Software Client Architect
Software Group
Australia

A typical project that a Technology Architect would work on would be to design the infrastructure and operational aspects for the deployment of a new business application. Normally, I will be given the statement of a business problem and a description of the application that the customer wants to deploy to address that problem.

Working with the customer and the application owners, I will gather a list of nonfunctional requirements, a view of the existing environment, a list of standards that I have to comply with, and begin looking for examples of a similar deployment that I could use as a reference or a starting point.



Steve Twist describes a typical project (continued)

- More tasks:
 - Write a project definition.
 - Produce a system context diagram.
 - Draw up an Architecture Overview Diagram.
 - Document decisions made during the Design phase.
 - Obtain solution sign-off.
 - Develop an Operational Model.



Senior Certified Architect
Software Client Architect
Software Group
Australia

Once I have all of those, I will write a project definition describing what I am going to do and what I am going to deliver as the architect for the project. I will produce system context diagrams to describe the scope of the solution and determine what is inside and outside my boundary of design.

And then, I will begin drawing up an Architecture Overview Diagram showing the key aspects of the solution. Most importantly, as I go through the project, I will be documenting any decisions that I have made during the Design phase. Once the solution has been signed off, I will then work with an IT Specialist to develop the operational model that can then be used by the Design team to build the solution and have it implemented and run.

I wish you well in your career as a Technology Architect, and I welcome you into the IBM program.

Module Outline



- Introduction and Objectives
- What are Architect specializations?
- Business Architecture
- Enterprise Architecture
- IT Architecture – Application Architecture
- IT Architecture – Information Architecture
- IT Architecture – Integration Architecture
- IT Architecture – Technology Architecture
- ▶ **Applying Capabilities from Multiple Specializations**
- Summary

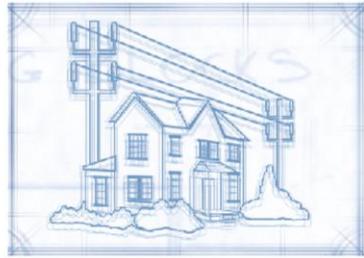
The next topic is the Applying Capabilities from Multiple Specializations.

No specializations stand alone



Architects tend to specialize in a focused area. However, they are likely to acquire knowledge, skills, and experience in multiple specializations.

Specializations are different aspects of the overall architecture developed.



People tend to specialize instead of mastering portions of multiple areas. This does not mean that you are likely to become so focused on a particular specialization that you know virtually nothing about other specializations. In the course of developing architectural solutions, you are likely to acquire knowledge, skills, and experience in multiple specializations. However, you probably find your capabilities clustering in one specific specialization.

No specialization stands alone. You might think of the different specializations as being separate. However, they are related views of the solution. For example, when you build a house, you will need the floor plan, an electrical plan, a plumbing layout, a structural view, a lot view of the placement of the house, a landscape plan, and so on.

These items are related views of the house from the different points of view. Similarly, in an architectural solution, architectures, such as the Business, Enterprise, Technology, Application, and Information Architectures, are not separate solutions. They are aspects of the overall architecture developed, under the guidance of a lead architect, by experts in the specializations.



Few Architects are experts in all of the specializations. To lead a team of Architects, you should be able to do the following tasks:

Few Architects are experts in all of the specializations, yet most solutions of any significance require expert application of capabilities in several specializations. If you are a lead architect faced with a complex problem to solve, how do you resolve this apparent paradox?

Although you are not an expert in every specialization, to lead a team of architects and devise an effective merger of their skills, you should be able to do the following tasks.



Few Architects are experts in all of the specializations. To lead a team of Architects, you should be able to do the following tasks:



Understand how the specializations complement one another. The specialization capabilities were chosen because they address tools, technologies, and architectural styles that cover the entire information technology spectrum.

You should understand how technologies in multiple areas might be applied to a business problem to provide an IT or business solution. For example, you should have some knowledge of how application architectures depend on and are affected by middleware and application services, database design and technology, and elements of the other specializations--even though you might not be an expert in those areas.



Few Architects are experts in all of the specializations. To lead a team of Architects, you should be able to do the following tasks:



Know the design issues in other specializations. As an Architect, you should know where the problems are that require expert help to solve.



Few Architects are experts in all of the specializations. To lead a team of Architects, you should be able to do the following tasks:



Know about the design trade-offs to be made across specializations. A wise man once said, "Design is the allocation of pain." You will likely find this to be true when you begin to consider the consequences of your design decisions for specializations other than those for which you are most familiar.

Applying capabilities from multiple specializations (5 of 6)



Few Architects are experts in all of the specializations. To lead a team of Architects, you should be able to do the following tasks:



Identify the type of capabilities needed to build your team. You should be able to identify the capabilities needed to build the solution. This might require you to establish a team of Architects from different specializations, IT Specialists, and even consultants with deeper knowledge about the specialization than you might have.



Few Architects are experts in all of the specializations. To lead a team of Architects, you should be able to do the following tasks:



Communicate with specialization experts. Although you might not be an expert in a particular specialization, you must be able to communicate with those who are. As an effective communicator and a lead architect, you can interpret your vision of the solution and its overall architecture to discuss problems and exercise critical judgment regarding the actions of your team.

To ensure effective communication between architects from different specializations, a standard “language” is important. The Architecture Description Standard (ADS) is a set of conventions for notation, terminology, and semantics used to describe the architecture of an IT system. The ADS was discussed in Module 2 of this course.

Module Outline



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- IT Architecture – Technology Architecture
- Applying Capabilities from Multiple Specializations
- ▶ **Summary**

Let's conclude with a summary of this module.



- Architect specializations are focal areas of best practices and development guidance for Architects.
- Architect specializations are inter-related and complement each other.
- There are three Architect specializations and one of them has four sub-specializations. For simplicity, we often refer to six specializations.
- Architects must declare a specialization when applying for Architect Certification.
- Each specialization has a set of capabilities defined.
- Specializations are related views of the same solution.

In summary, Architect specializations are focal areas of best practices and development guidance for Architects. Architect specializations are inter-related and complement each other. There are three Architect specializations and one of them has four sub-specializations.

For simplicity, we often refer to six specializations. Architects must declare a specialization when applying for Architect Certification. Each specialization has a set of capabilities defined. Specializations are related views of the same solution.

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This concludes the Architect Specializations module of the course.