Reflective Case Analysis 5:

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1. Stakeholders

Stakeholder	Position	Primary Project Role	Primary Concern(s)
Australian Vocational Network (AVN)	The country's premier vocational organization	Client	Ensuring that clients such as Third Eye Media follow specific technical, structural, and pedagogical guidelines for the design and development of learning objects that AVN will potentially use in its training programs.
Caroline Porter	CEO, Third Eye Media	Boss	Keeping an important client (AVN) and potentially lucrative contract.
L.J. Smith	Director, Learning Materials Division, AVN	Quality Control, AVN	Doubting Third Eye Media's ability to complete the project based on sub-standard initial assessment and feedback report.
AVN project manager (not named)	AVN project manager	Project Manager (AVN side)	Ensuring AVN's technical specifications are met with Third Eye Media's proof-of-concept learning object.
Joe Strickler	Industry-appointed oil exploration expert	SME	Ensuring that deep-sea oil exploration training needs and competencies are represented.

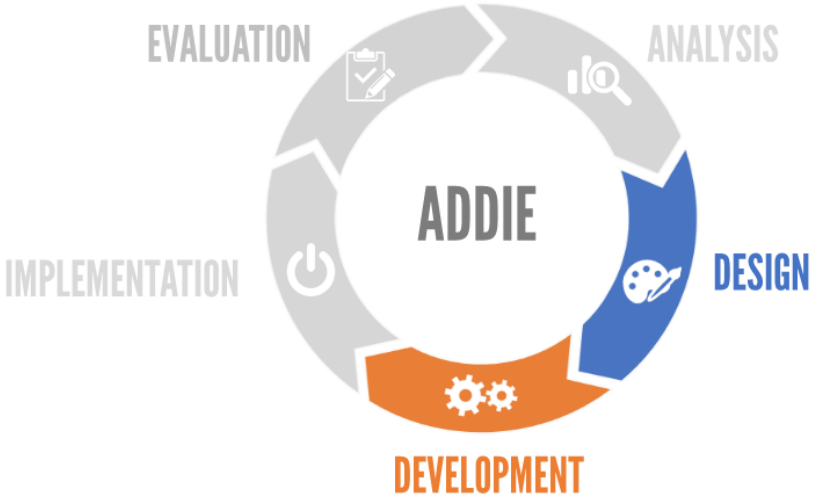
Simon Wilcowsky	E-learning production manager, Third Eye Media	Production Manager	Redesigning and developing the deep-sea oil exploration object to meet AVN's technical and pedagogical specifications, industry requirements, and, most importantly, to please AVN and retain the $100,000 contract that Third Eye Media had originally won for the project.
Margaret Janson	Instructional designer	Lead Instructional Designer	Redeveloping the poorly produced and evaluated proof-of-concept learning object previously submitted by Simon using the types of interactivity and authentic engagement that AVN originally requested in its memorandum.
Deep-sea oil exploration trainees	New employees; employees to be reaccredited	Audience	--

2. ID Challenges

Simon asked Margaret to take the lead ID role in an important project that Simon has failed to deliver following the client's (AVN) very specific specifications. Because the stakes are high for both Simon Media (retaining a lucrative development contract) and Third Eye (retaining its reputation), Margaret will need to salvage the project by developing a quality proof-of-concept that can be delivered quickly and which adheres to AVN's specific learning object development standards.

Based on AVN's original memorandum outlining design guidelines and learning object specifications for contractors such as Third Eye Media, as well as on the assessment and feedback memorandum prepared by AVN's director of the Learning Materials Division, it is clear that Simon's delivered proof-of-concept failed to address several key requirements.

Accordingly, Margaret will need to scrap Simon's original proof-of-concept submission and produce a new proof-of-concept for the deep-sea oil rig learning object from scratch. Specifically, she will need to ensure that the redesigned learning object is user-centered and interactive, with the learning context authentic in both its depiction of the deep-sea oil exploration environment and the issues that need to be solved in such an environment. Because of the need to completely redo the learning object, Margaret's key ID challenges will fall within the design and development stages of the ADDIE model.



Margaret's specific ID challenges are as follows:

ID Challenge 1: Design and develop a proof-of-concept for a suite of learning objects that is interactive, authentic in context, and learner-centered.

AVN's memo regarding learning object specifications is very specific with regard to the teaching and learning approaches that should inform the contractor's design and development of learning objects. Specifically, the memo foregrounds the need to focus on student-centered learning, which stresses application and synthesis over knowledge acquisition, to be realized in authentic settings drenched in context rather than on static representations of text. Because the

first proof-of-concept that Simon delivered failed to account for these elements, Margaret will have to re-think the design approach and identify and incorporate instructional techniques that will generate the level of student-centered interactivity that AVN expects its contractors to deliver

ID Challenge 2: Design and develop a proof-of-concept for a suite of learning objects that is engaging, intuitive to navigate, and visually attractive.

AVN's memo regarding learning object specifications also emphasizes the need to incorporate visually attractive, motivating, and well-organized resources. The assessment and feedback report prepared by AVN's Learning Materials Division director evaluated Simon's proof-of-concept deliverable as confusing and of "poor appearance," with a "plain" learning environment. Margaret's challenge will be to ensure that the instructional techniques she employs to create an interactive, authentic, and learner-centered proof-of-concept are rendered in an engaging, intuitive, and aesthetically pleasing learning environment.

Case-Specific Constraints

There are several case-specific constraints that Margaret will need to address as she redesigns and develops the deep-sea oil rig learning object.

Constraint 1: AVN's expectations for a revised proof-of-concept are extremely high.

Because AVN summarily rejected Simon's delivered proof-of-concept, which resulted in it threatening to rescind the project contract and take its business elsewhere, AVN's expectations for a revised proof-of-concept are extremely high.

Challenge: Will Margaret be able to deliver a new learning design object that not only meets AVN's design standards but convinces it that its training needs are in good hands with Third Eye Media?

Constraint 2: AVN has prescribed a set of structural, technical, and pedagogical specifications to guide the development of learning objects—and to which it expects contractors such as Third Eye Media to completely adhere.

Although AVN's specifications are not unreasonable or difficult to achieve, Margaret will be challenged to do so when creating the learning object from scratch while on a limited design and development budget and time frame.

Challenge: Given time and budget constraints, will Margaret be able to redesign and develop a deep-sea oil rig learning object that meets AVN's structural, technical, pedagogical, as well as aesthetic specifications?

Constraint 3: There is no written training material available to use as primary content.

In his confidential memo to Caroline, Simon addressed two issues related to learning object content. The first issue referenced the disagreement between the AVN project manager and the Industry Committee regarding the selection of content. The second issue Simon referenced was the difficulty in obtaining and identifying actual content resources because the existing content was taught orally in a face-to-face, apprentice model; accordingly, there was no proprietary written content available around which to build the learning object.

Challenge: Will Margaret be able to create a learning object that meets all of AVN's pedagogical specifications without having pre-written course content?

Constraint 4: A proof-of-concept requirement that represents at least 40% of the final project.

In his confidential memo to Caroline, Simon also referenced the unrealistic expectation of meeting AVN's proof-of-concept requirement that 40% of the learning objects be complete. Even though the 40% completion figure is not a standard practice, Margaret will nevertheless need to deliver learning objects that are substantially complete both to overcome the substandard proof-of-concept that Simon delivered while also convincing AVN that this project, as well as all subsequent projects, will be in very capable hands.

Challenge: Will Margaret be able to deliver a proof-of-concept that not only meets AVN's quantitative expectation but also AVN's qualitative expectations?

Constraint 5: There is a very limited budget and short time frame.

Because Third Eye Media will not be able to use the money from the $100,000 contract it still potentially has with AVN, it will have to bear the expenses of the learning object redesign out of pocket, which likely means that Margaret will not have a lot of money with which to work. And even though Simon was successful in convincing AVN to give him a second chance, he did not get any more time to deliver the proof-of-concept, which means Margaret will have weeks, rather than months, to complete the proof-of-concept.

Challenge: Will Margaret be able to deliver a proof-of-concept that looks polished and meets all of AVN's specifications for learning objects on a limited budget and tight time frame?

Based on these specific ID challenges and the case-specific constraints that Margaret must address, I have prioritized the design challenges and case-specific constraints as follows:

#	Challenge/Constraint	Type
1	Design and develop a proof-of-concept for a suite of learning objects that is interactive, authentic in context, and learner-centered.	ID Challenge 1
2	AVN has prescribed a set of structural, technical, and pedagogical specifications to guide the development of learning objects—and to which it expects contractors such as Third Eye Media to completely adhere.	Case Constraint 2
3	Limited budget and short time frame.	Case Constraint 5
4	There is no formal written training material available to use as primary content.	Case Constraint 3
5	A requirement that the proof-of-concept represent at least 40% of the final project.	Case Constraint 4
6	Design and develop a proof-of-concept for a suite of learning objects that is engaging, intuitive to navigate, and visually attractive.	ID Challenge 2
7	AVN's expectations for a revised proof-of-concept are extremely high.	Case Constraint 1

I have ranked the first ID challenge as the top priority precisely because Margaret has been brought on to the project to redesign the proof-of-concept from scratch to ensure that it accounts for all of the elements that Simon's deliverable does not, specifically that it be interactive, authentic in context, and learner-centered. The constraint I ranked as priority 2 is only a constraint insomuch as it represents the specific expectations that Simon did not fulfill with his proof-of-concept. By adhering to AVN's structural, technical, and pedagogical

specifications for commissioned learning objects, Margaret will find that the remaining constraints and ID challenges she faces will be easier to address. Specifically, the learning activities that Margaret chooses will affect the extent to which she is able to produce the proof-of-concept on a limited budget and in a short time frame (constraint 5), which is why I ranked this constraint third.

By taking into account the pedagogical specifications, as well as the budget and time frame, Margaret will have a better idea of the type of content she will need for the learning object, which is why I ranked the lack of written training material (constraint 3) and the requirement that the proof-of-concept represent at least 40% of the final project (constraint 4) fourth and fifth, respectively, on the list of priorities. Depending on the instructional strategy Margaret selects for the redesign, she may not need to incorporate formally written training material as the primary content to complete the proof-of-concept; likewise, a more learner-centered, constructivist-based instructional strategy, which is inherently dynamic and interactive, is harder to quantify because it is not measured in words, though it still provides coverage of the learning objectives. In contrast, it was clear that Simon's deliverable, with the crude look of the extraneous clipart, dull text, and waterfall model flowchart, as represented in the proof-of-concept example screenshots submitted to AVN for evaluation, was not a finished product. This is why I also prioritized ID challenge 2 next to last: An interactive and learner-centered approach is also typically engaging, intuitive to navigate, and visual. If Margaret delivers a revised proof-of-concept that is all of these things—interactive, engaging, learner-centered, authentic, intuitive, and aesthetically pleasing—she will more than meet AVN's extremely high expectations, which is why I ranked this constraint last.

3. Application of Readings/Experiences to Case Study

How did the week's assigned readings contribute to your analysis?

I usually don't think of my projects in terms of learning objects, so several of this week's readings provided a nice refresher on both the features of learning objects and the advantages of using learning objects. Although there does not seem to be a pat definition of what constitutes a learning object (Beck & Baggio, 2007; Driscoll, 2004), the concept of "granularity" is for me the key instructional design element. I've completed several projects that I would redo now by "chunking" the training into more granular learning objects. Because these projects were long and essentially published in SCORM as one extended learning object (e.g., a 2-hour course), repurposing the material for other related courses was problematic. Moreover, in terms of learner cognitive load, controlling the granularity of the learning objects can better facilitate learning by reducing the amount of information the user is asked to take in.

For Margaret's design challenge, I tried to think of manageable and self-contained solutions that would both make the learning objects granular enough to promote effective learning and allow Margaret to redesign and develop the proof-of-concept on a tighter schedule and budget.

Oliver's (2006) description of reusable learning tasks was also helpful in formulating possible solutions for Margaret, particularly in determining whether a scenario-based solution could meet AVN's learning objective specifications. I've found that scenarios truly become authentic learning settings when authentic tasks are incorporated. Scenarios that come across as canned or artificial will typically ask learners to make a simple decision based on a very narrow range of choices. Conversely, the scenarios I've found most effective are those that mirror the workplace and ask learners to perform authentic tasks using elements in the scenario that learners

would also find native to their workplace environment, such as documents, policies and procedures, and even personnel.

How did your previous experiences contribute to your analysis?

I had a somewhat analogous design and development challenge on a project I completed not too long ago. A former colleague was working for a financial services firm, and he was suddenly put in charge of compliance training. Because of the ongoing anti-money laundering (AML) requirements financial institutions were required to comply with, including an AML training requirement, he was tasked with organizing an AML training program. Because of the size of the company, he wanted to create the training program online so that the training could be easily administered, tracked, and reported to demonstrate compliance.

When he approached me to help him assemble the training materials in an online format, he had only a bunch of PowerPoint slides larded with text and extraneous graphics—a presentation not too dissimilar from the one Simon delivered as his proof-of-concept. He asked me if there was a way to make the training more engaging, so I asked him what specifically he wanted the trainees to be able to do. After he told me that the training was intended to be a framework to get both front-of- and back-of-house employees to identify money laundering patterns and activity, we both agreed that creating a series of in-depth learning scenarios for the different financial areas (commercial banking, private banking, and retail financial services) would be the best approach. To this end, we recreated the work environment in the scenario interface to match that of the employees and designed several learning scenarios that were comprehensive in terms of allowing the trainees to find and use different documents and evidence, such as phone calls, website searches, and e-mails from supervisors, which were all specifically created for each scenario.

When I first read this case, scenario-based learning immediately came to mind as a possible solution to Margaret's proof-of-concept design challenge. I found during my experience working on the AML training that scenarios meet all of AVN's learning-object specifications; when they are well-designed and developed, scenarios are engaging, interactive, and authentic, and they position the learner to be an active constructor of knowledge rather than a passive receiver of information. They can also be created in e-learning authorware programs, such as Captivate or Storyline, and published in SCORM, which makes them deliverable to any learning management system. Accordingly, my primary solution to Margaret's design challenges is a scenario-based learning solution.

4. Possible Solutions

For the redesigned proof-of-concept, Margaret will need to account for a range of technical, pedagogical, and aesthetic elements that both meet AVN's specifications for learning objects and mitigate the negative impression that Simon's deliverable made, as evidenced by AVN's assessment and feedback report in which several critical deficiencies in the learning object were identified. To this end, Margaret will need to ensure that the proof-of-concept is engaging and interactive, learner-centered, and grounded in an authentic context that suits the needs of both AVN and the oil exploration industry—and do so without the aid of a primary source of written content. Moreover, the proof-of-concept redesign has to be developed within an extremely tight time frame and on a limited budget while still conveying the impression of a polished deliverable that will inspire AVN's confidence in Third Eye Media sufficiently to award it the $100,000 contract. Below are two solutions that attempt to address these issues.

Solution 1

To ensure that the redesigned and developed proof-of-concept meets AVN's specifications for learning objects created by contractors, solution one is to design and develop two modules, each of which consists of a learning object that contains a learning scenario covering single learning objectives. Each module will be self-contained so that it can be used discretely in connection with connected training modules (for new employees that need to be accredited or for the re-accreditation of employees with experience), and each learning object can be paired with other learning objects in other training contexts. Regardless of how the learning objects will be used, they will be SCORM-compliant so that they can be delivered by any learning management system (LMS).

A scenario-based learning approach will also meet AVN's pedagogical specifications. Each learning object/scenario will immerse learners in an authentic work-based context in which they have to handle a critical issue or resolve a problem using both a range of elements in the learning environment and prior knowledge. By immersing trainees in an authentic situation and activating their prior knowledge, the scenario format creates a highly interactive, learner-centered experience, as the scenarios will unfold based on decisions made by users as they complete tasks natural to the work environment. This foregrounds learning by doing and allows the learner to make mistakes, which is both crucial to the learning process and to the eventual mastery of skills (McLaren, 2008).

To ensure that the scenario context and situations are authentic and relevant to current deep-sea exploration and underwater field issues, this solution will use Martin Howe as a subject matter expert, rather than rely on textbook content, which Simon deemed to be too advanced; moreover, the textbook content will not allow for the creation of effective problem-based or exploratory learning. By having Martin Howe—based on content coverage suggestions from Joe

Strickler, AVN's industry-appointed oil exploration SME—design realistic scenario situations, map possible decision and result paths, and provide remediation on choices and solutions, the focus of the learning object will be developing learner skills and improving work performance rather than learning facts and processes, which limits training to the realm of knowledge acquisition. This solution addresses the design challenges and constraints associated with the project in the following ways:

Challenge/Constraint	How Challenge/Constraint Is Addressed
ID Challenge 1: Design and develop a proof-of-concept for a suite of learning objects that is interactive, authentic in context, and learner-centered.	By structuring a learning object around a discrete learning scenario, which is inherently interactive, authentic, and learner-centered, Margaret will achieve the primary elements missing from Simon's proof-of-concept, such as the lack of an active role for learners; a focus on synthesis and application rather than on knowledge acquisition; authenticity of context; and allowing multiple pathways through the learning material.
Case Constraint 2: AVN has prescribed a set of structural, technical, and pedagogical specifications to guide the development of learning objects—and to which it expects contractors such as Third Eye Media to completely adhere.	Because of the interactive, learner centered, and contextualized nature of scenario-based learning, Margaret's delivering a proof-of-concept using learning scenarios will fulfill virtually all of AVN's specifications as outlined in its memo to learning object contractors. In terms of structural requirements, a scenario-based learning object will be designed around a work-based context that immerses the learner in a realistic, problem-based environment; scenarios can contain multiple branches, which can contain sub-scenarios that cover single learning objectives. In terms of meeting AVN's technical requirements, because learning scenarios can be developed in e-learning software such as Storyline 2 or Captivate, they can be self-contained and published in the SCORM format and uploaded into any LMS.

	In terms of meeting AVN's pedagogical requirements, scenario-based learning is inherently constructivist because the learner has to make decisions based on the processing information available. Because situations in learning scenarios are designed to reflect authentic, real-life settings, learners can also bring their prior knowledge and skills to inform their decision-making processes.
Case Constraint 5: Limited budget and short time frame.	Scenario-based learning objects can be developed on a smaller budget because they do not require the extensive content creation that a text-based learning object such as the one Simon's proof-of-concept would require. Although scenarios require more visual content to support different shuttling options when users make decisions or choices to advance the scenario, Margaret and her team should create at least one functional, even polished, scenario-based learning object in a short period of time using a high-quality template, stock images, and, where necessary, custom illustrations to enhance the deep-sea exploration and drilling environment of the learning object. Moreover, web-based applications such as invision.com can be used to mock up a fully functional scenario should there not be sufficient time to finalize the learning object in Storyline.

Case Constraint 3: There is no formal written training material available to use as primary content.	Because learning scenarios are based on context and situations, formal written training material is not as important to the design and development of the scenario as it is for the development of a text-based course such as the one Simon represented in his proof-of-concept deliverable. Using an SME who has been in the field such as Martin Howe to create a scenario situation, potential outcomes, and information or elements that need to be processed to arrive at a solution mitigate the need to use formal written training content such as the advanced textbook material Simon referenced not be current or authentic and focuses on knowledge acquisition rather than on skills development, which may not be appropriate for or relevant to the training's target audience.
Case Constraint 4: A requirement that the proof-of-concept represent at least 40% of the final project.	Because one learning scenario can encompass one learning object (and one module), submitting two learning scenarios/objects functional enough to cover multiple learning objectives should be sufficient to meet the proof-of-concept requirement, particularly if four learning scenarios, each of which should encompass an associated work-based context, are sufficient to use in a number of different learning module variations.

ID Challenge 2: Design and develop a proof-of-concept for a suite of learning objects that is engaging, intuitive to navigate, and visually attractive.	By using learning scenarios as the focus of the learning objects, Margaret will be able to create a proof-of-concept that is engaging, intuitive to navigate, and visually attractive. Specifically, because learning scenarios place the learner in a first-person context to solve a particular problem by working through an authentic situation to which learners can bring their prior knowledge, scenario-based learning is inherently motivating. To present the information needed to resolve the scenario situation and guide learners through the different choices they can make, as well as the consequences of their choices on other elements in the scenario, scenario navigation must be nonlinear, yet intuitive. Finally, because scenarios must depict an authentic situation, which can also consist of realistic supporting materials to facilitate the scenario's solution, this context must possess a certain fidelity to real life, which will necessitate a heightened visual realism (and attractiveness).
Case Constraint 1: AVN's expectations for a revised proof-of-concept are extremely high.	The pressure is on Margaret to deliver a high-quality proof-of-concept since Third Eye Media has been given a second chance, albeit with less time and a smaller budget. A well-designed learning scenario, however, will meet all of AVN's very specific learning object technical and pedagogical guidelines. If Margaret can get her team to give the learning objects a very polished visual look—and if she is able to incorporate a learner-centered, interactive, and authentic environment into the scenarios—AVN should be more than pleased with the revised proof-of-concept.

Solution 2

To ensure that the redesigned and developed proof-of-concept meets AVN's specifications for learning objects created by contractors, solution 2 is to design and develop a

complete module for the accreditation of new employees. Per AVM's requirements, the module will consist of a self-contained learning object so that it can be used discretely in connection with connected training modules or repurposed with other learning objects in other training contexts. Regardless of the how the proof-of-concept learning object will be used, it will be SCORM-compliant so that it can be delivered by any learning management system (LMS).

As in solution 1, Martin Howe, who has just returned from a lengthy stint on an oil rig, will be used as the primary SME to create content based on content coverage suggestions from Joe Strickler, AVN's industry-appointed oil exploration SME. However, for this solution, Martin's involvement in creating content will be more extensive than in solution 1. Because no written content is available, and because this training was originally done in person using a face-to-face apprentice model, Howe will record a series of 2–3 minute audio/video microlectures done from the perspective of an expert teaching an apprentice, which retains the same apprentice-based model that currently characterizes the field. In addition to creating a somewhat more formalized account of what is involved in training and developing skills for the field, these microlectures can then be used to flesh out specific underwater exploration competencies and lend the content both currency and authenticity because the content will be created by somebody currently working in the field. The microlectures, which will be produced in MP4 format, can then be structured and incorporated into a more stylized interface that simulates the master–apprentice dynamic; this interface will create a learner-centered experience by having new employees go through a simulated apprentice experience in which they choose a path and then move up levels as a certain number of steps or new employee training proficiencies are completed. The self-tests that AVN requires as part of its learning object requirements can be used as "challenges" that new employees will have to pass to advance to the next learning

object/part of the training. This solution addresses the design challenges and the constraints associated with the project in the following ways:

Challenge/Constraint	How Challenge/Constraint Is Addressed
ID Challenge 1: Design and develop a proof-of-concept for a suite of learning objects that is interactive, authentic in context, and learner-centered.	By structuring a learning object around a series of video microlectures, which can be arrayed in an interactive, authentic, and learner-centered way by positioning the new trainee in a simulated apprenticeship with Martin's short videos functioning as the master/guide of the deep-sea oil exploration environment, Margaret can achieve the primary structural and pedagogical elements missing from Simon's original proof-of-concept deliverable.
Case Constraint 2: AVN has prescribed a set of structural, technical, and pedagogical specifications to guide the development of learning objects—and to which it expects contractors such as Third Eye Media to completely adhere.	Because of the interactive, learner-centered, and contextualized nature of a simulated master/apprenticeship experience that focuses on key aspects of the deep-sea oil exploration field, this solution will fulfill virtually all of AVN's specifications for learning objects. In terms of AVN's structural requirements, a master/apprenticeship simulation is grounded in an authentic context; simulations do not have to be linear, so the learner can choose a path to follow in the simulation, with self-check "challenges" functioning as gateways to the next learning level (which would be a different learning object). In terms of meeting AVN's technical requirements, because the guided simulation can be developed with any e-learning software such as Storyline 2 or Captivate, it can be published in a SCORM format and uploaded into any learning management system.
Case Constraint 5: Limited budget and short time frame.	Because the main focus of this solution features a series of microlectures that will be recorded by Martin Howe, the videos can be recorded by Martin from his location using a simple screen recording application such as Camtasia; doing so will reduce both the time and expense involved in bringing Martin to Third Eye Media. Likewise, content created by Martin can be reviewed in an online

	collaborative space such as WebEx to indicate any revisions that need to be made. In terms of the limited time frame, while Martin is recording the microlectures, Margaret's team can build out the simulation template into which Martin's content will be incorporated as it is completed.
Case Constraint 3: There is no formal written training material available to use as primary content.	Having Martin Howe record a series of microlectures covering the areas and sub-areas related to the key competencies of deep-sea oil exploration eliminates the need for written content to use as the primary learning material. Once the learning objects are completed, however, Martin's microlectures can be transcribed so that written material can be used in conjunction with the online training, such as a job aid, for example.
Case Constraint 4: A requirement that the proof-of-concept represent at least 40% of the final project.	Because a series of microlectures can be incorporated in one learning object (and one module), submitting several microlectures arrayed in a functional master–apprentice simulation interface with self-check "challenges" should be sufficient to meet the 40% proof-of-concept requirement.
ID Challenge 2: Design and develop a proof-of-concept for a suite of learning objects that is engaging, intuitive to navigate, and visually attractive.	By using microlectures to drive the content and a master–apprentice simulation as the theme of the proof-of-concept redesign, Margaret will be able to create an engaging, intuitive to navigate, and visually attractive learning object. Specifically, because the "apprentice" will be taken through an authentic training path, which does not have to be completed in a linear fashion, this solution is learner centered, allowing a certain navigational autonomy. Finally, because the master–apprentice training path depicts an authentic trajectory of skills that the apprentice must master, it will possess a certain fidelity to the training that new employees would undergo were the training delivered face-to-face in the actual work environment (e.g., an off-shore oil rig); this alignment with job competencies will also necessitate a workplace fidelity, requiring a heightened visual realism

	far beyond the visuals created by Simon in his proof-of-concept deliverable.
Case Constraint 1: AVN's expectations for a revised proof-of-concept are extremely high.	Simon is fortunate that AVN has given him a second chance to deliver a proof-of-concept. Unfortunately, he will have to do so with a far more limited budget and time frame. This said, a media-rich, intuitive, nonlinear learning object that simulates the master–apprentice dynamic will fulfill AVN's learning object technical and pedagogical guidelines, which should satisfy AVN enough to permanently award Third Eye Media with the $100,000 project contract.

5. Pros and Cons

Solution 1 Pros

Pro	Result
A scenario that focuses on "doing" rather than "telling."	The "doing" vs "telling" distinction is at the heart of a learner-centered approach in which the learner is the active constructor of meaning rather than a passive, empty vessel into which content is poured. Using scenarios as the basis for the proof-of-concept will meet most, if not all, of AVN's specifications for learning objects, in particular the areas for which Simon's deliverable was evaluated low: active learning, information processing, authenticity, motivation, and nonlinearity.
Scenario-based learning is highly interactive and inherently authentic to the training context.	One of AVN's primary requirements for learning objects is that they immerse "the learner in a realistic, problem-based environment that engages the learner to use the content objects" (Sims & Waldron, 2014, p. 221). Learning scenarios, with their inherently interactive format in which the learner has to access a range of elements native to the training environment to process information sufficiently enough to solve the scenario, will fulfill this specification.

Extensive formal written content does not need to be created to drive scenario-based learning as much as it does in a text-based course such as the one proposed in Simon's proof-of-concept.	Martin Howe, as subject matter expert for this redesign, will be asked to devise learning scenarios situations, elements, and solutions rather than create a lot of formal content. Such formal content would not be effective with a learning object that focuses on getting the learner to "do" rather than being "told."
Learning scenarios, with their situation-problem-resolution format, are inherently self-contained.	Content that is self-contained will fulfill AVN's requirement that learning objects be repurposable. Moreover, learning scenarios have the advantage of not being too large; large learning objects would lack granularity and have to be reworked to repurpose in other contexts, which would defeat the purpose of the learning object (Driscoll, 2004). By using scenarios, AVN can reuse the scenarios in different training contexts—for example for new employees who need to be initially accredited or for more experienced employees who need to be reaccredited.
Scenarios can be designed to be ill-structured so that there is no single "correct" solution, which can in turn engage the learner in more active processing.	The ill-structured nature of scenarios more accurately mirrors job performance issues, which in turn allows learning through negotiation of performance rather than simply through the acquisition of knowledge, as is the emphasis in Simon's proof-of-concept deliverable.

Solution 1 Cons

Con	Result
Scenarios can be more time- and resource-intensive to design and develop.	Although there is less overt content required to develop a learning scenario, the media content, mapping of responses to learners' decisions, and supporting materials to scaffold the scenario can require more time and a larger budget to produce.
Scenarios can be perceived as artificial or canned.	A scenario is only effective as it is deep. Scenarios not designed to function at a certain level of complexity can be consciously or unconsciously deemed superficial by the user, which then undermines the feelings of authenticity, interactivity, and learner-centeredness.

There is no overt self-test identified by AVN as an essential element of the learning object structure.	Learning scenarios do not necessarily incorporate a discrete self-test as part of the scenario because the purpose of a learning scenario is to guide the learner to make decisions by applying skills developed in the scenario. Although an overt self-test may be superfluous with a learning scenario, AVN may not be pleased that this learning object is not specifically met.

Solution 2 Pros

Pro	Result
Using a microlecture format built around a master–apprentice simulated training tour does not require the use of extensive formal written content.	Bypassing the need to create extensive written content materials and instead using microlectures recorded by the SME will reduce the production time and reduce straining an already tight budget.
Using short microlectures as an instructional mode rather than text allows the use of content-rich media that users find visually attractive and engaging.	Microlectures as a content format deliver chunked information both visually and auditorily, which users generally find more engaging than only accessing material visually (e.g., text).

Solution 2 Cons

Con	Result
The master–apprentice simulation is not overtly problem based or ill structured.	Though the master–apprentice format will allow the learner some navigational autonomy, it is not rooted in problem solving, so the amount of active processing the learner does may not be at the level that occurs when completing a learning scenario.
Microlectures created off site by Martin Howe may not be polished, quality wise.	Although Martin Howe's content will likely be at a high level of quality due to his field experience, the actual microlectures he records may suffer from quality issues (e.g., sound) or contain problems with cohesion because he will not be reading from a completed script.

Establishing the granularity of the learning object using the microlectures is not as clear cut as using scenarios.	AVN makes it clear in its learning object specifications that within each module there should be smaller learning objects that cover single learning objectives. Because microlectures are designed to be bite-sized pieces of information, determining how many microlectures constitutes a self-contained learning object may be challenging.

6. Final Recommendation

Based on AVN's learning object specifications and the feedback from the evaluation of Simon's proof-of-concept, Solution 1, which recommends a scenario-based approach, seems to be the most effective way for Margaret to meet AVN's learning object specifications and project expectations. First, learning scenarios are interactive, authentic, and learner-centered—elements that were missing from Simon's proof-of-concept and that AVN specifies are required for its learning objects developed by contractors. Moreover, scenario-based learning foregrounds problem solving; with its ill-structured nature, a scenario will more accurately mirror job performance issues, which in turn allows learning through the negotiation of performance rather than the rote acquisition of knowledge (the emphasis in Simon's proof-of-concept deliverable). Because learning scenarios can be developed in e-learning software, such as Storyline 2 or Captivate, they can be self-contained and published in SCORM format and uploaded into any LMS, which meets AVN's technical requirements.

One main con to Solution 1 is that scenarios, with their media content, their mapping of responses to learners' decisions, and their supporting materials, can require more time to design and develop. However, once the main elements are created, they can be templated and repurposed in additional scenarios/learning objects. For the purposes of Margaret's proof-of-concept, the key will be to capture the look of the scenario environment, which should mirror the

work context (e.g., an offshore oil rig) as well as demonstrate the problem or issue that learners will be asked to solve and the various ways the learner can reach a solution. With a full team behind her, Margaret should be able to produce a visually rich and interactive scenario, even if it's just a proof-of-concept.

Another con to Solution 1 is that learning scenarios can be perceived as overly canned. One way to avoid this artificiality is to create authentic tasks with more than one solution, rather than creating a simplified problem or issue that can be solved with a single response or action; workplace issues are typically complex, so an effective learning scenario will reflect that complexity. Also, ensuring that the look and feel of the scenario mirrors the environment for which the learner is being trained creates a certain verisimilitude, one that is vital to mitigating the sense of artificiality that can undermine a training scenario.

A final con to Solution 1 is that with a scenario-based solution, there would be no overt self-test, which for AVN is an essential element of the learning-object structure. However, with a properly designed and developed learning scenario, an overt self-test can be incorporated authentically into the learning scenario in the form of a debriefing between characters, workers and supervisors. Such an assessment will more accurately measure learners' abilities to apply skills and knowledge than will a self-test that solely evaluates learners' abilities to memorize terms or facts.

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