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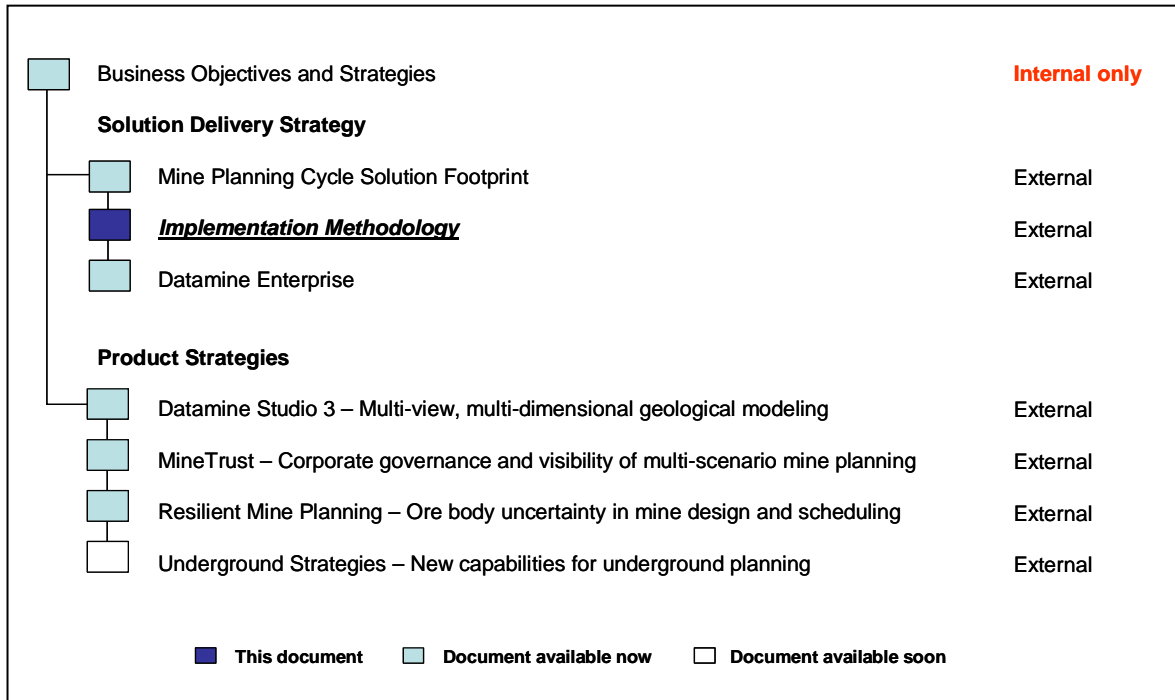
The Datamine Group

# Datamine

## Implementation Methodology

*An Overview of the Datamine Implementation Methodology used for all Datamine projects requiring re-engineered operational processes due to (i) the implementation of Datamine technology in existing operations, (ii) the integration of Datamine technology with other systems or (iii) the definition and configuration of customized Datamine Enterprise technology modules.*

## Datamine White Papers



This is one of a series of Datamine White Papers designed to inform Datamine clients and employees about the strategies and directions of Datamine’s business and solutions. Some of these documents, as indicated above, are available to employees only.

This document explains Datamine’s Implementation Methodology which defines the path to follow when implementing mining technology solutions from the Mine Planning Cycle solution footprint.

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# Datamine Implementation Methodology

*Ensuring quality outcomes for projects where new technology is used to improve operational work practices.*

## 1 Introduction

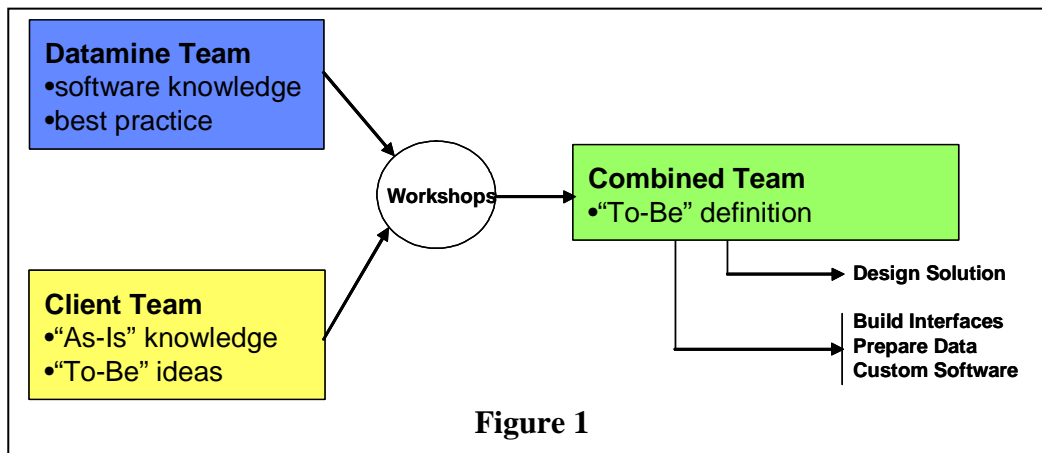
Datamine has a comprehensive solution footprint for the Mine Planning Cycle with solutions ranging from exploration through to mine design and scheduling and into to in-pit production operations. For these solutions to bring substantial and lasting financial and operational benefits they need to be **implemented** into the day-to-day work processes of the geology office, mine planning department or production operations room.

It is generally not sufficient just to train users in all the functions that a particular piece of software has to offer. The real benefits of using Datamine software are derived when the operations that the software are used to facilitate are understood, documented and then “embedded” as part of the day-to-day activities for all users in that department or operational area. For example, if Datamine OreController is used to determine dig lines in the pit, then it is important for all grade control staff to be familiar with work the flow for processing samples and incorporating the assay results back into the grade control model in order to delineate dig lines. To ensure consistent results that can applied quickly in the operations as well as be measured and improved it is important that the same process is followed at all times.

At Datamine we call the mechanism of defining those processes, mapping them to the software functionality and teaching people how to do their jobs using the technology **implementation** and we use a carefully engineered “implementation methodology” to ensure that all Datamine projects are conducted in a quality controlled environment that ensure outcomes are achieved and benefits are realized with every project.

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## 2 Background



To ensure all Datamine solutions are implemented properly Datamine requires its consultants to make use of the Datamine Implementation Methodology, and all Datamine technical consultants are trained in this methodology as well as the associated project management techniques.

The Datamine Implementation Methodology addresses a difficult problem often observed by professionals implementing technical software: On the one hand, the software developer's consultants understand the software and are familiar with best practice as conducted by many companies around the world. On the other hand, the client team understands the current operational processes (As-Is) and generally have a reasonable idea of where they would like to move the operations to (To-Be). The problem is depicted in the diagram above and articulated in the question: "What is the best and most efficient process to combine these two groups of knowledge to get the best outcome?"

The Datamine Implementation Methodology solves this problem by giving the Datamine consultants the skill sets and framework to lead projects in a way that will ensure:

- work practices are established which use the technology and the skills of the clients' staff to their best advantage
- new work practices are firmly embedded into day-to-day operations and staff do not revert to "the old method" once the consultants leave the site
- project risks are defined early and managed professionally

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- project costs and timings are estimated accurately during planning
  - project expenditure is managed closely during project execution
  - all project issues are communicated clearly and openly to the client

Datamine conducts projects with a “no surprises” policy and is always clear and open with the client project manager about both the negative and positive aspects of a project so that issues and problems can be dealt with early and professionally.

This document is a short summary of each step in the Datamine implementation process – the inputs, the activities, the deliverables and expectations of each step.

### 3 Implementation Methodology Overview

The Datamine Implementation Methodology is designed to be a flexible roadmap of the paths to be taken to ensure the best possible outcomes from technology implementation projects.

Good technology implementations are a balance of three elements: *people, process and technology*, and using this methodology will ensure that the users - the people who must use the technology each day to improve operational performance - are placed at the center of all considerations. This is the key to delivering high productivity from new technology systems.

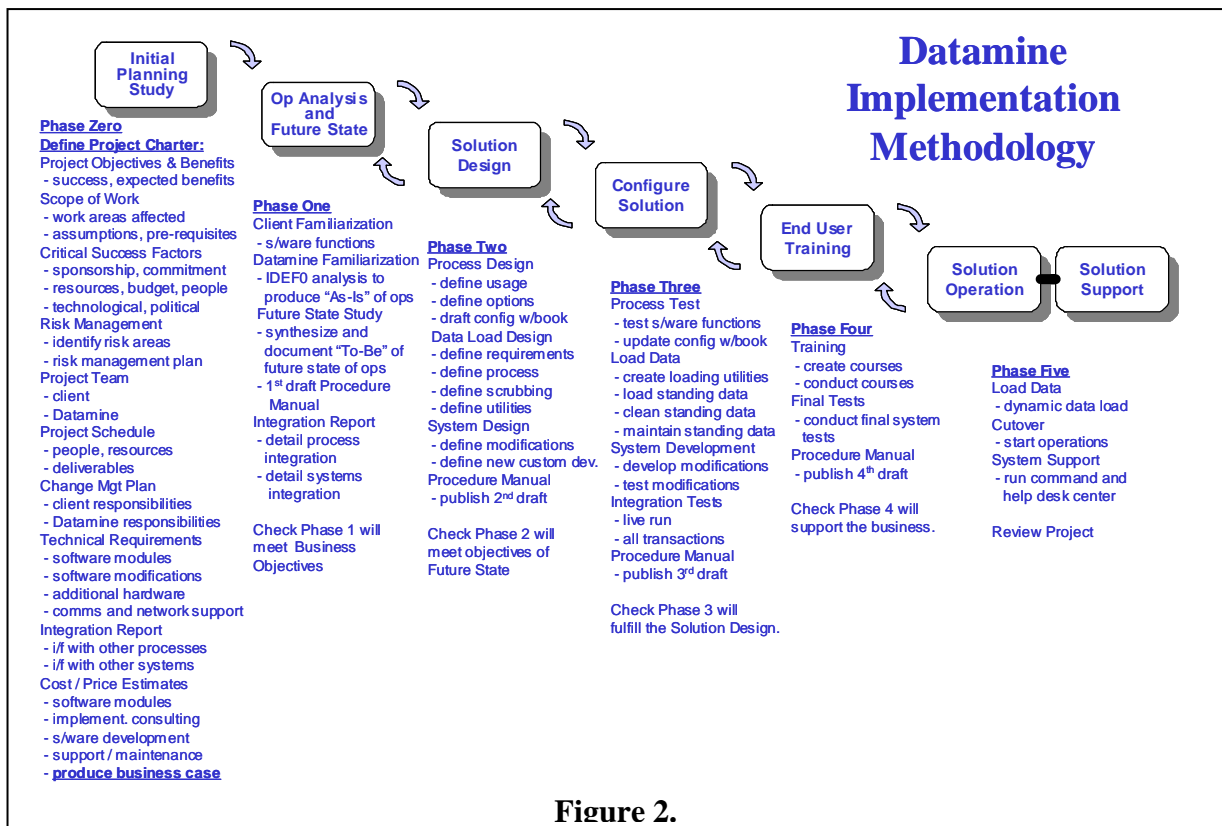


Figure 2.

At the start of the project an *initial planning study* emphasizes scoping the project, planning the activities, building a project team and defining the desired outcomes and benefits. The result of these preliminary tasks must be documented clearly in a Project Charter that is a written document that defines the objectives of the project and how the project will be executed. This may be the Datamine's proposal to the client or it may be a document that the project team puts together in the opening stages of the project.

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The Datamine consultant then leads the project team through an *operational analysis* of existing work processes to define the “As-Is” state of operations. This analysis is important as it puts the project team on a common foundation and reveals problems and shortcomings in the existing work practices. This “As-Is” analysis - combined with the knowledge of the technology and practices to be used - is the starting point for defining the *future state* or “To-Be” operational processes to be implemented.

It is quite common for the client to ask the Datamine consultants to skip directly to the “To-Be” phase of the project because there is a desire to “abandon the old and get on with the new”. While the enthusiasm is commendable it should be remembered that the “As-Is” phase is important for the following reasons:

- It is common that there is considerable misinformation and even disagreement on how work is currently performed.
- The whole project focuses on moving from the “As-Is” to the “To-Be”. It is difficult to plan a journey of change not knowing or agreeing the start point!

Once the future state has been defined the team can then match the skills of the users with the technology and the operational environment to produce a practical *solution design*. The key activity is to define and document in a procedure manual how the features of the software will be used in combination with the physical activities to form the operational procedure. In addition, this phase must also look at how work processes integrate with the rest of the working and technological environment by defining work process boundaries, technical interfaces, software modifications and data preparation activities.

The various members of the implementation team then use this solution design in a *solution configuration* phase to configure and test the software solution and address the other issues such as interfaces, software modifications and customization (or even software development) and data preparation.

Then comes the most important and difficult step – *end user training* to ensure that operational staff are trained in the work and the technology that they will use. The project team must carefully create useful training material, including real life scenarios. The team is in effect teaching the users how to do their jobs with the new technology and so this activity must be supported by a fully documented Procedure Manual.

The final step is to commission the *system operation* to “live” status and ensure (especially initially) that the users have sufficient *solution support* in the use of the new technology-enabled work processes.

## 4 General Guidelines

The Datamine Implementation Methodology has been developed as a memory tool or “aide memoire” to ensure that all of the major aspects of a technology implementation project are addressed. In the multiple activities and enthusiasm of a new project there are many aspects that can be forgotten or overlooked – these range from timely training of users through to the planning of data transfers prior to “going live”. Following the methodology reduces the opportunity for omitting important tasks and reduces the risk of the project failing.

It is not the purpose of the methodology to create unnecessary work or confusion in the project. Therefore the methodology should be used as a guide – and the amount of work and the detail required for each step – should remain the judgment of the project team and the decision of the project manager.

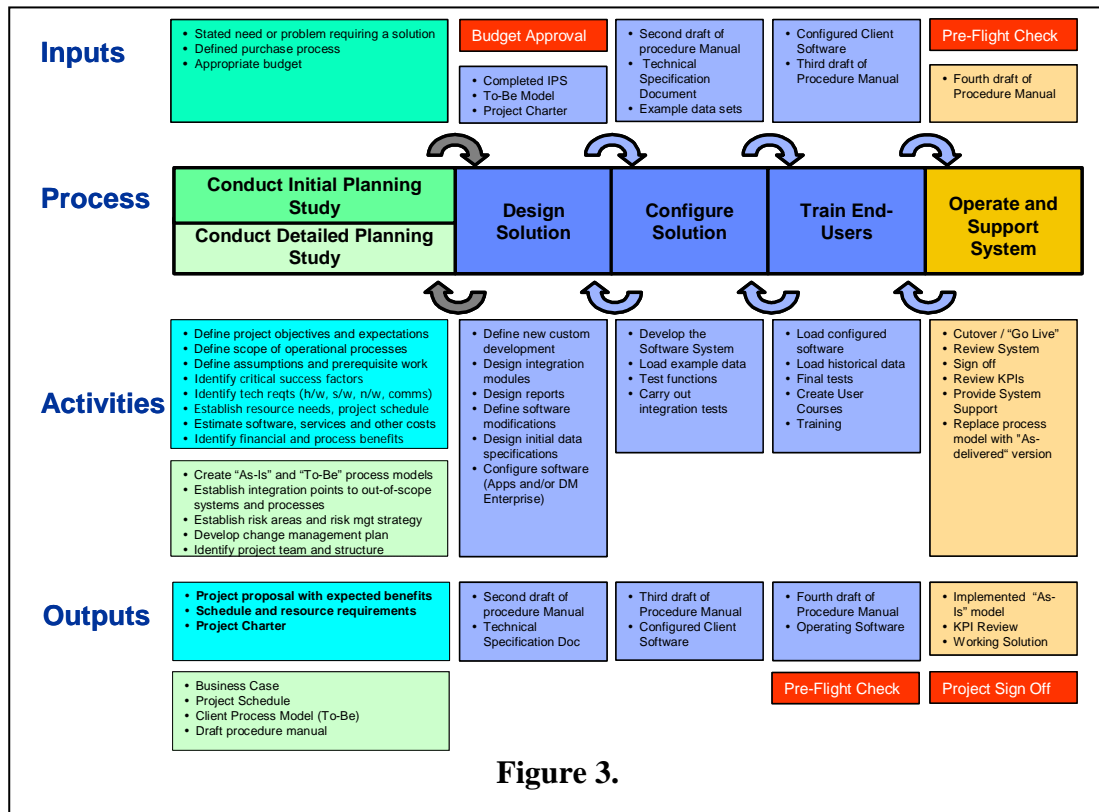


Figure 3.

The diagram in Figure 3 above shows the typical flow of an implementation project. Note the important points:

Phase 0 and Phase 1 as described in Figure 2 are often combined in the sales and budgeting part of the project that is conducted together with the client before the project is agreed contractually. The methodology allows flexibility for this to be

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done – generally as a two step “Initial Planning Study” (first column, above) that is performed initially for the budgeting and contract negotiating process and then partially repeated as the “Detailed Planning Study” in order to gather additional detail not addressed in the first pass. Note that the activities in the dark green boxes show the points that must be covered in order to build a plan that can be budgeted and the light green boxes show the points to be covered before moving to the next step.

All of the project steps are often inherently iterative. The work and investigations performed in any one stage can always highlight the fact that an issue in a previous stage has some shortcoming in logic or scope and requires further work to be useful or appropriate. The project team using the methodology should always be flexible in allowing iterations as far as time and budget permit – the objective is success in the project, not adherence to the methodology!

The purpose of the Datamine Implementation Methodology is to ensure high quality implementations that bring maximum benefits and achievement of desired outcomes with a minimum disruption to the client’s operations during the project. In some smaller projects it may not be necessary to formally perform or document all of the steps in the project. If the size or scope of the project dictates, it is quite sufficient to perform some of the tasks informally or in short meeting with the client. The watch word is “appropriate” use of the methodology and the defined steps, not slavish adherence to each step at the cost of the project success.

**Remember: the implementation project is not an objective in itself – it is merely a path to the real objectives - improved mining operations and business outcomes!**

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## **5 Phase Zero - Initial Planning Study**

The Initial Planning Study or IPS is quite often performed in two stages: the first stage being together with the client in a “first pass” as part of the marketing and sales process to gather enough material for a project proposal and establish the need, benefit, cost and budget before the project is approved. The “second pass” is then often performed as part of the approved project when the project team is more formal and returns to cover some of the issues that were not addressed in first process, or not covered in enough detail for project purposes.

Either way, one of the key deliverables for the IPS should be the Project Charter which establishes the “ground rules” for the project. The project charter is embodied in a document that details and agrees the rules of engagement for a project, especially in defining the roles and responsibilities between the client and Datamine.

A comprehensive project charter can be established by covering the following points in this section. The project charter is typically derived from activities already undertaken such as preparing the proposal, the kick-off meeting, commercial negotiations, etc.

### **5.1 Project Objectives and Benefits**

The operational objectives of the project must be defined and documented as well as the benefits expected from these objectives. These include not only the measurable operational results (eg, 10% less variation in head grade) but also the financial benefits that is expected to bring (eg mineral process savings of \$100,000 per month).

### **5.2 Scope of Work**

The scope of the project is the subject areas to be covered during the project. It should also include a definition of the “boundaries” of the project, because it is often as important to define what will NOT be included as it is to define those that will.

For example, in establishing the scope for an exploration database system, the scope may cover planning, drilling, logging, surveying and verification of exploration drill holes, but may exclude the assaying and chemical analysis of the samples in a laboratory. At the boundary of this interaction it would be wise to document, say, that assay samples must be bagged and tagged with labels provided by the laboratory and delivered to the laboratory along with a diskette containing sample numbers and drill hole details.

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### **5.3 Critical Success Factors**

Both the Datamine manager and the client manager commissioning the project must understand the critical success factors of the project. The obvious issues are good quality software and supporting hardware, but the success of the project seldom hinges on those factors. There are often more serious issues that require discussion and management.

Quite often change will only be effective if the client project staff observes senior management enthusiasm and sponsorship for the project. The new solution must be something that is seen as being required by the senior management, not just some form of technical exercise. These issues must be highlighted and discussed openly and appropriately between the Datamine project manager and the client's executive sponsor of the project.

### **5.4 Risk Management**

Areas of high concern that could cause the difference between success and failure (eg. senior management sponsorship, sufficient hardware capacity, adequate budget, end user training, etc) must be defined and documented along with a management plan for these risks. The risk factors must be reviewed at project review meetings to ensure the risk is still being managed appropriately.

### **5.5 Project Team**

The project team from both Datamine and the client staff must be selected with the view to how they can make a difference to the project's success. The client project manager must demonstrate pro-active management characteristics and enthusiasm for the project. The project team will require full or part-time "domain experts" who are knowledgeable about the mine's current processes and enthusiastic about improving them.

The selection of the project team is a very critical success factor and the project manager and domain experts should not necessarily be selected because of their current "line management" positions. The people selected must have not only the management authority (that must be clearly granted to them if their current line positions do not automatically command it) but they must also have the "moral authority" that is granted to them by the respect of their colleagues peers. These are leaders who will be determining how work will be designed for other colleagues, and they must have the respect of those colleagues for the project to produce maximum benefits.

As part of the team selection it must be understood how much time the project will absorb and that must be planned for. Practically speaking most projects will require additional work for the team outside their "normal jobs", and the attitude to this reality should also influence the selection of the team.

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## **5.6 Project Schedule**

The project manager must draw up a project schedule that includes all steps in the implementation, who will be accountable for them, and the estimated time they will take to complete. A plan will not work unless there is a schedule!

When preparing the project schedule it is important to make sure that it is more than just a Gantt chart in Microsoft Project (or similar). It should also include a brief description of all of the activities and deliverables in the project.

## **5.7 Change Management Plan**

The best form of change management is communication and cooperation. The team must understand the main areas of impact of the planned changes and then ensure that all affected parties form part of the planning and “buy in” process, or are at least notified in a timely fashion, depending on the level of impact on their work area. A plan for this communication at all stages of the project should be separately identifiable as part of the project schedule, and will normally include activities such as “road shows” to different site, management information seminars etc. This is an ongoing activity and should be scheduled to occur during the entire course of the project.

## **5.8 Technical Requirements**

A defined list of software, hardware, and network infrastructure for communications must be drawn up and budgeted. This may have two aspects that should be treated differently, firstly the requirements for the project team during the project and secondly the requirements when the system is operational.

If the acquisition and installation of the additional hardware and communications infrastructure includes additional work by the project team during the project, then project schedule should be updated accordingly.

## **5.9 Integration Report**

Points where the implementation of this project “touches” the rest of the organization both in terms of work processes and technical interfaces must be defined. This integration report forms part of the detailed scoping of the project and these integration points must be defined and understood so that the magnitude of change imposed on other work areas can be managed.

Plans must be in place to ensure that changes to work areas outside of the project (ie the responsibility of a different person or team) must be communicated, discussed and planned for.

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### **5.10 Cost and Price Estimates (Business Case)**

The whole project must be priced, resourced and costed in a sound business case and a “check point” put in place to ensure that cost and impact of the project is understood by senior management and that the benefits to be achieved are commensurate with the cost of the project.

It is at the end of Phase Zero that full and detailed impact of the resource requirement and the expected benefits can be assessed, and especially in larger projects the project team and steering committee should review the viability of the project at this point. This business case must be argued logically and soundly, detailing both benefits and risks.

If the benefits do not justify the cost and the effort, then the most common cause is that the objectives and outcomes have been “low-balled”, ie the client has not demanded enough of itself in terms of change and improved productivity, and these objectives and outcomes should be reviewed.

### **5.11 Project Charter**

The Project Charter is the sum of all of the steps mentioned in this phase documented and presented in such a way that the cost, conduct and impact of the ongoing project is well defined and understood by all stakeholders.

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## 6 Phase One – Operational Analysis and Future State

The key objective of Phase One is to decide what the new operational and work processes will be when using the technology. This has two considerations:

- Most projects start with an inherent dislocation that must be addressed as mentioned in the introduction to this document: The client knows about the current work processes and practices (“As-Is) in detail but may not know the scope of the technology that is available to improve these processes. On the other hand, Datamine has detailed knowledge about the functionality of the technology and its best practice uses in other client sites, but may only be familiar with the current client’s processes in overview if at all.
- The future state of the processes, the so-called “To-Be” model, is a balance of two keys factors: - what the client wishes to do as well as what the technology enables the client to do.

Phase One addresses these two points and brings the skills and knowledge of both parties together to define the way forward.

### 6.1 Client Familiarisation Training

The client project team must be given overview training of the software components to be implemented. The purpose of this training is not to directly enable end users to immediately use the software as it will be used in operation, but to allow the client project team members to see what is possible in the technology.

It is not important that the client team members (project manager, domain experts) know the software in detail. They should get an overview understanding of the capabilities that allows them to decide how it will be used at a high level. The detailed work of how the software will be used on a function by function level comes later.

### 6.2 Operational Analysis (“As-Is”)

The project team must understand what the client currently does in each process step. These processes must be captured, documented and agreed, and the easiest way to do this is with a “process modeling tool”. Datamine uses the IDEF0 methodology for process decomposition (a formal methodology developed for the US military) and the AIOWin process modeling software for capturing and documenting the analysis.

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The activity is usually conducted as a workshop with one person leading and facilitating the discussion, starting with the high level processes and information flows within the organization, and another person documenting the “As-Is” work processes in real time in AIOWin.

Because the domain experts have already had the familiarization training in the software technology they will be using, they will already start to formulate new ways to improve these processes.

### **6.3 Future State Study (“To-Be”)**

Datamine and the client conduct workshops in which they use their combined familiarity with the software to be used and the knowledge of the current operational processes to formulate and synthesize new processes that improve the work process by using the new technology to its utmost. This future state or “To-Be” analysis is also documented in AIOWin.

A Draft Procedure Manual should be commenced so that the new work procedures can be evaluated from the user point of view. It may be sufficient to capture this information in AIOWin itself.

### **6.4 Integration Report**

The Integration Report should be updated to document in detail all possible technology and process integration points. The impact should be communicated, discussed and planned for with each manager affected by the integration.

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It is important to note that the analysis and documentation reached in this phase MUST comply with the scoped and costed plan of Phase Zero – if it does not, then some issues in the original phase may need to be revisited and discussed again with the client.

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## **7 Phase Two – Solution Design**

The objective of Phase Two is to create a solution design for the combination of people, process and technology that will fulfill the business objectives of the project. In practical terms it means specifying how the software will be used, and by whom, to achieve the desired outcomes. If the objective is to have speedy and accurate resource and reserve calculations which will withstand any audit scrutiny, for example, then the solution design must include all aspects of the process (field geology, laboratory, mine geology, long range mine planning, etc).

This is more than a technology design – that is only part of the challenge to be addressed. It must include a comprehensive specification of how various systems will function to comply with the “To-Be” processes that have been defined in Phase One. It must also include a sensitivity to the skill levels and job descriptions of the personnel involved on a day-to-day level, and whether (in this case, for example) they meet the appropriate criteria to be deemed “qualified personnel” or “competent persons” according to the reporting code being employed.

### **7.1 Process Design**

Decide how the software is going to be used and configured to meet the future state or “To-Be” requirements of each work process. Document the usage and options settings to be used in the Configuration Workbook which defines how the software will be configured for the end user.

### **7.2 Data Load Design**

Document the historical data (eg drill hole data, survey data, assay data, etc) that is to be loaded into the system for the commencement of operations. Define who and how this will be formatted, reviewed, cleaned, etc, as well as any utilities required to get the data to this status.

### **7.3 System Design**

Define any software functions in detail – modifications or new modules – that must be developed for the “live” system operation. This will include interfaces to systems identified as in the Integration Report.

### **7.4 Procedure Manual**

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Redraft the procedure manual started in Phase One with more detailed now that the processes have been defined in more detail and documented as software settings, etc, in the Configuration Workbook.

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The deliverables of this phase need to be checked to ensure that they are consistent with the Future State definition and the Project Charter defined in Phases Zero and One.

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## **8 Phase Three – Solution Build**

The objective of Phase Three is to finalize the system for live end user training.

### **8.1 Process Test**

Use Test Scripts and Scenarios that ensure the solution processes operate correctly and produce the required results. Ensure that any changes to the configuration of how the software should be used are updated in the Configuration Workbook.

### **8.2 Load Data**

Build any data load utilities and use them to load, test and clean the initial operational data. Maintain it in the new system if necessary. This step can be quite large and should not be overlooked or considered as trivial.

### **8.3 System Development**

Develop and test any new software modifications or enhancements to be used in the final implemented system.

### **8.4 Integration Tests**

Start running integration tests of entire processes and transaction or scenario types, especially those that cross the boundaries to other systems.

### **8.5 Procedure Manual**

Update the Procedure Manual that will be used by end users.

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The deliverables of this phase need to be checked to ensure that they are consistent with the Solution Design and the Project Charter.

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## 9 Phase Four – End User Training

The objectives of Phase Four are to ensure (i) the end users have sufficient training to use the system, that (ii) the system is completed and tested, and (iii) the Procedure Manual is up-to-date and ready to use when end-users start using the system in live operations.

### 9.1 Training

Create courses and course material suitable for the end users and then conduct the end user training as close as possible to the date of cutover to the live system.

Note that this training should differ significantly to the familiarization training delivered to the project manager and domain experts at the start of the project. This training is NOT devoted to teaching users how all of the various functions and features of the software work – it is focused on teaching them how to do their jobs with the newly designed solution.

There is a very substantial difference between these two aspects of the training, and it must be observed strictly to ensure the success of the project. It can be said that the success of the project can hinge very substantially on the preparation and delivery of end user training – if end users do not know what they have to do with the software on a day-to-day basis, the hard work and dedication of the project team may well be in vain.

### 9.2 Final Tests

Conduct final system test to check for the solution functionality, appropriateness of the loaded historical data, capability of developed software and the integration with other systems and processes.

### 9.3 Procedure Manual

Ensure that any changes are recorded in the Procedure Manual *and that the end users are notified*, possibly with refresher training if necessary.

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Check that the final results of Phase Four will actually support the business as defined at the beginning of the project, and that they are consistent with the Project Charter.

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## **10 Phase Five – System Operation – System Support**

The objective of Phase Five is to ensure the cut over to live running is successful.

### **10.1 Load Data**

Just prior to live running operational live data must be loaded to the system for the last time ready for the cutover to the new system.

### **10.2 Cutover**

End users start using the system and (generally) stop using the previous system or methodology.

### **10.3 Systems Support**

The help desk and/or support facilities that have been defined for intensive support for the first few days/weeks of operations are put in place commissioned.

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The project should be reviewed for effectiveness, success, and financial benefits.