6. BIM Coordination

6.1 Organizing BIMC

As discussed in the previous chapters, there are different ways to design and position Intelligent Customer capabilities within BIMC and every enterprise will have its own interpretation. However, the objective and the resulting tasks are comparable for every enterprise. The approach we will describe in this chapter concerns structural insights into how to deal with customers and suppliers, how you measure performance and how you can handle such a process from a budgetary perspective. We will also cover essential operational, day to day processes. You must be able to:

- make agreements with your business users,
- translate the work into a standardized approach where practical, negotiate with service providers,
- and you always check on performance.

Further, you translate these structural solutions into standard working methods, procedures, and standard processes that are repeatable in various situations. This approach explains why we can identify components for BIMC as building blocks, or ingredients that can be used in every situation to shape the structure (think DNA). The way in which ingredients are combined determines what the management function looks like within the enterprise.

Our starting point regarding BIM is therefore that BIMC operational management may be different for each enterprise, but that the ingredients that every enterprise can choose from are comparable. However, be observant that the set-up of BIMC depends on the strategy that the enterprise wants to follow with regard to digitization and/or the data and information needed by the enterprise and the information services provided, and to be provided.

We should state once more that there are **no new (or fancy) theories about management or coordination** in this book; the emphasis is on a practical approach that examines the various, existing best practices of the Intelligent Customer, well-respected guidance about program and project management, infrastructure management and the coherence between these ingredients within the framework of DID.

DID focuses very much on continuous improvement. BIMC fulfils a bridging function between the demand from the enterprise and the supply from the service providers. BIMC takes over the information needs of the business/LoB and translates this into a SMART[16] formulated assignment for information/data suppliers. BIM needs are translated in such a way that they fit the enterprise-wide agreements on standardization, quality and price. BIMC then monitors the level and volume of the services. In this way the function can assist the Board in creation of policies that can provide strategic guidance; where the processes are placed in context of the DID model, BIMC provides strategic guidance with regard to digitization generally and BIM.

To clarify the tasks and logical steps within BIMC and to illustrate continuous improvement over time, we fall back on the evergreen of quality management tools, namely the Deming Plan-Do-Check-Act cycle (PDCA cycle). See Figure 6.1.

[16] Specific, Measurable, Acceptable (or Achievable), Result-oriented (or Relevant) and Time-bound

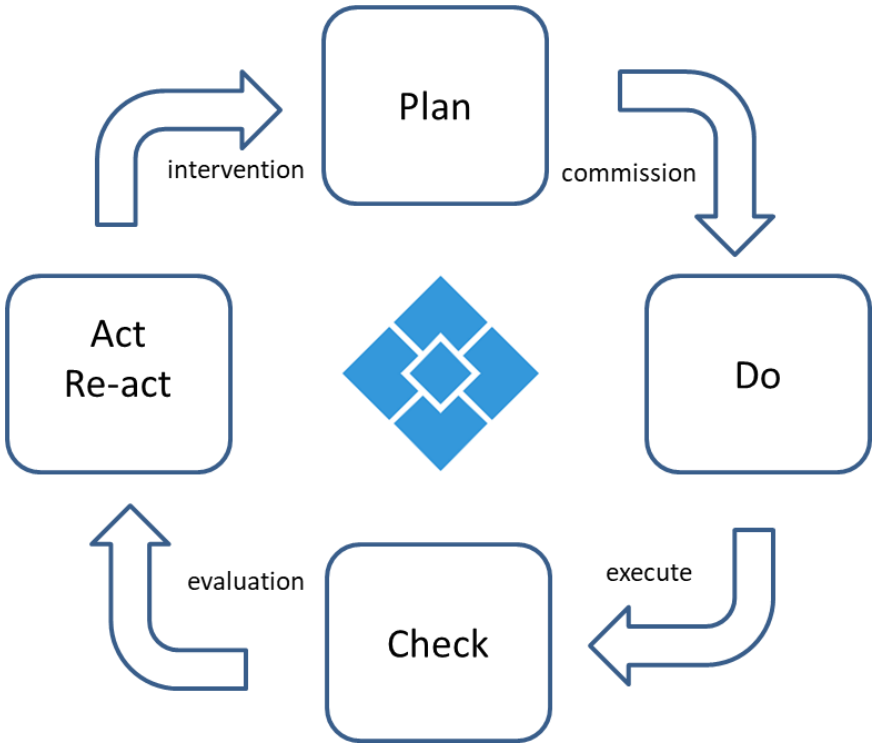

Figure 6.1 Deming, the Intelligent Customer and DID

The necessary BIMC capabilities, extrapolated from the intelligent customer guidance, are linked to one another in a quality cycle in the form of the Plan-Do-Check-Act (PDCA) cycle. The DID domains (governance, strategy, improvement and operation) are directly related to PDCA and thus the three best practices are linked. Using the Deming circle, we demonstrate that the development towards a mature BIMC goes through a cycle of quality improvement. BIMC focuses on results. Every time this cycle is completed, BIMC strives for an even better and more effective result. This touches on the essence of the PDCA cycle. Based on this, in Figure 6.1, we can illustrate the management activities of BIMC that are interconnected through processes. The main processes of BIMC are integrated with the entirety of the enterprise.

Each main step from the Deming circle contains a cluster of responsibilities. These responsibilities relate to BIM responsibilities in the four DID perspectives Business, Service, Data/Information and Technology, and would be the responsibility of BIMC. The various responsibilities are the substantive tasks of BIMC and therefore the business information activities can be related to the best practice intelligent customer responsibilities. These four responsibilities are:

- policy, innovation and advice (PIA) management (Plan, mostly Governance in the DID model),
- contract management (Do, mostly Strategy in the DID model),
- control management (Check, mostly Improvement in the DID model)
- and user management (Act, clearly the Operational focus of the DID model).

The practitioner needs to be fully aware of operational issues. Keep in mind that **each** of the stages of PDCA will require you to think strategically, tactically and operationally because for example, a decision regarding a legal issue leading to a change in data policy will strategically impact many information services and may alter plans to improve services. This sort of decision has tactical implications regarding for example, testing of new information services and unless someone is aware of the possible operational implications, users might encounter unexpected problems. Operations will inevitably focused on and cover all triggered incidents, requests and changes. Even here there

will be elements of strategy and tactics since some triggers will cause developments or improvements that will impact the overall strategy for BIM and may be a trigger for policy changes.

The use of the PDCA cycle is a practical way to complete the tasks of BIMC. We also observe similar management functions emerging within facility services, human resources and increasingly in other disciplines. The division into these four main groups is easily applicable to all disciplines. It is also important to determine that professional terms from a specific domain do not stand in the way of the nature of a BIMC practice, hence the choice of Deming's terminology. In other words, just make sure everyone knows what the responsibilities are that relate to the nomenclature.

In practice, any BIMC should ultimately function so well that all processes run smoothly. If you assessed all tasks in detail, you could say that each area of responsibility contributes to every process. In practice, however, it will appear that, depending on the need, several formal or informal consultation events will be required between the employees of the individual business areas to ensure that the processes run as effectively and efficiently as possible.

Case Study; Re-implementing a legacy system and 'Technology Watch'[17]

Why watch technology?

Isn't that rather like watching paint dry? Software systems are embedded in a technical environment comprising hardware, middleware and software. That environment is constantly changing. It often seems the hardware elements are replaced as fashion dictates, for instance the mainframe is replaced by a network of distributed PCs. Later the PC network is replaced by a cloud server, which in essence back to square one, namely a mainframe but now called an enterprise server, while the green screen terminals are replaced by much more expensive PCs with browsers.

Some software elements, e.g., the data management system, a data communication framework or a particular programming language are no longer supported. Or support from certain software providers is terminated, maybe because they terminate this line of business. Without support the user cannot go on using their products, unless others take over. On top of that, the existing technology may no longer be fashionable so that users are unable to recruit new personnel. Users are sometimes forced by industry to replace or update their products periodically. As with many other lines of business, the consumers of software are driven by the producers.

The question is often asked, '*Why should users want to renovate their old legacy environment?*' Largely, the answer is because changing the environment is not always desirable because of high risks and often high investments. It is not *just* a question of money. The existing software may contain special features which have matured over the years and no one in IT would dream of 'sunsetting' them because of special needs of users or features that are difficult to reproduce. As liaison with the enterprise on this subject, BIMC needs to assess the impact, the risks concerning business continuity and raising of service costs. And BIMC needs to escalate matters to the Board when disruption is a real possibility.

An example from the automotive industry

In this particular case, that of an automobile leasing system, the functionality of the legacy business is dependent on maintenance and sustainability and of course quality. As a nod to the future, the business architect and business information consultant, together with the technical

[17] For more information about Re-implementation see also Sneed, H., Verhoef, C, (2019),

architect and application manager were asked to come up with an acceptable solution to upgrading technology. The system was originally implemented in the late 1970s, and regular software upgrades have allowed the software to reach a high degree of maturity, often matching modern requirements.

So; what to do? There are several ways that the IT professional can change existing software e.g. converting, re-implementing, re-developing, 'wrapping' existing software behind one or more access interfaces or to replace it with a shiny, new existing standard system. And 99 times out of 100, maybe more, the business neither knows nor cares what 'wrapping', or re-implementing, or whatever even means. BIMC needs to both understand and care.

Any choice has advantages and disadvantages that need to be analyzed. If conversion is not feasible, wrapping is not desired, redevelopment is not affordable, and replacement is out the question-- that leaves re-implementation as a compromise solution between conversion and re-development. In fact, it becomes the solution by default since it is always possible and it can be done with a reduced effort and at low risk.

On the basis of earlier experiences and the underlying business case, the BIMC team in this case study selected re-implementation. Re-implementation meant rewriting the original code in another language and/or platform based on a re-documentation of that code. This distinguishes it from a conversion where the code is translated statement by statement to the target language. Re-implementation requires human judgement. Re-implementation can only be partially automated. Human thought is required to reconstruct the target code. Re-implementation is considered in two steps: first a model of an existing program is abstracted from the code and existing documentation. In the second step that model is implemented in the same or another language.

The result is a different solution to the same problem. In this case study other approaches already failed and although the re-implementation project is not finished yet, already useful results are produced. And without BIMC to assist, the business users would have been marooned without advice from a trusted resource.

6.2 Strategic and Tactical Tasks within BIMC

As explained in chapter four and described in the Intelligent Customer guidance we can distinguish four areas of responsibilities where tasks for BIMC can be identified:

- Policy, innovation and advisory (PIA) management
- Contract management
- Management control
- User management

In the next four paragraphs corresponding tasks and activities are explained in detail. Of course, it will depend on your enterprise which tasks and activities are most important. Keep in mind that

BIMC does not always carry out **all** of the above activities and most often is responsible only for the tactical level activities. Day-to-day support is often delegated to a service desk .

6.2.1 Tasks within Policy, innovation and advisory management (PIA)

The added value of BIMC is most often to be found in the substantive knowledge and expertise that it has of its own enterprise and the data needs of the enterprise together with oversight of the professional disciplines that impact BIM for which it is responsible, such as IT, database processing, data/information security, enterprise/business architecture, the program/project portfolio and perhaps peripheral issues that might have some BIM impact such as facilities and housing services and the environment, physical security, in-house emergency services.

This group of tasks guarantees and develops the strategic and substantive connection between environment, customer, user and supplier. BIMC advises management (policy and coordination) about this and monitors the content and implementation of projects and programs. There are therefore three broad task areas:

- strategy formation;
- translating needs into functionality;
- monitor and determine the enterprise structure.

1. Strategy formation
With strategy, we strive for the continuation of the primary business objectives. The mission and goals of the enterprise are dictated by the political developments, market, user groups, possibilities of technology, *et cetera*. The strategy relating to operational management support is achievement of the mission and objectives of operational management. Working with Operations will often necessitate new agreements to be made, and deviations might be required with regard to frameworks and policy.

The advisory role includes consulting executive management about market developments. An example is the standardized design of the physical environment in such a way that the workplace fits in well with the individual wishes of the users. Advice might also be required about investment in new information systems, renovations, legacy technology, reuse and the vexed question of knowledge sharing.

2. Translate from need to functionality
To translate business demand into service provision, while also fulfilling the mission of the enterprise, the requested solutions should fit into a larger whole in which coherence is coordinated. The domain therefore provides a common language between enterprise, information and infrastructure. The requirement is determined within user management.

Effective coordination must take place with the implementing party. Desired changes that may have consequences for the implementing party will have to be coordinated at the architectural level at an early stage. Each time, a trade-off is made between flexibility and manageability by drawing up standards to achieve the desired quality at optimum cost. This ensures that future developments continue to fit within a whole (no islands of automation or knowledge). To achieve this, it is necessary that the management of the enterprise ensures that all departments work within the architecture.

3. Monitoring and determining the enterprise structure

It is necessary to ensure a consistent set of principles and models that provides coordination of the design and implementation of the processes, the enterprise structure and the provision of information. Monitoring the technical infrastructure for the customer is also a key process. Technical services integration covers monitoring and guaranteeing the coherence of the supplier-transcending production processes and the infrastructure, including ensuring that there are good agreements regarding the functionalities of the total production chain.

Service integration (activity) integrates the different subsystems into one coherent whole, such that the different subsystems communicate smoothly and effectively with each other. From the perspective of the user and customer, the work environment functions as a whole, in look and feel and in operation. It is important within the joint offering of services that individual components for IT services are integrated and offered as a whole within an enterprise. Services integration has two aspects:

1. technical integration, regulated by BIMC through contributions to management policy, innovations and controls through assessing changes in business outcomes, information needs or services or innovation of services for compatibility with the portfolio, and
2. the architecture/ blueprint of the business operations.

In addition, there is a business, information/data, service and technical perspective of service integration. This responsibility lies largely with contract management. The actual integration will usually lie with the service provider and BIMC will ensure that the integration also takes place. The activities for Policy, Innovation and Advisory activities of the function are summarized in Table 6.1.

Table 6 .1 Policy, Innovation and Advisory tasks

Strategy formation	• Strategic policy making and frameworks. • Translate business strategy. • Adaptive response to changing environment or business operations. • Outsourcing strategy. • Market exploration
Translate from need to functionality	Translate business demand into products and services. • Advising business operations. • Development of new products and services. • Release calendar and priorities. • Feasibility tests. • Supply technical and functional programs of requirements for purchasing and suppliers.
Monitor and determine the enterprise structure	• Determine and maintain the architecture / blueprint. • Monitor overview and coherence for all services. • Assess the impact on these services in the event of changes. • Manage and establish basic functionality. • Coherence of portfolio and architecture / blueprint with services and products suppliers (technical services integration)

6.2.2 Tasks within contract management

For completeness of understanding, we will expand information about the responsibility of contract management; this focuses on making agreements to agree the desired services with either internal or external parties, in a contract, to actively and unequivocally record, manage and monitor all term agreements in a contract, as well as to provide the agreed. The aim is to be able to control the risks that arise because agreements are made with external parties, to monitor and optimize costs and to ensure the services are delivered effectively and efficiently. However, the contract cannot be an end in itself but is a derivative and forms the basis for the relationships between customer and supplier. In general, the focus area of contract management pursues a number of things:

- For concluding contracts: translating internal needs into market supply, market exploration (identifying suitable suppliers), obtaining the most favorable agreements and reducing uncertainties about future performance.
- For the execution of contracts: providing insight into and keeping the contracts and ensuring that the appropriate level of performance is delivered with the right quality, at the right time and in the right place.
- For extending or terminating contracts: at a time that is most favorable to the enterprise.

Contract management therefore undertakes the following activities:
- the delivery of services and products (supply side);
- contract and supplier management;
- market and client and contracting.

1. The delivery of services and products (supply side)
Contract management offers support in determining business needs and translating them into a program of requirements. Subsequently, contract management - in collaboration with the Purchasing department, takes care of the conclusion of the contract and the contractual agreements on the performance to be delivered (specify, select and contract), as well as on changes to the existing agreements. In addition, contract management assesses the contracts at the conclusion and periodically during the contract period.

Contract management also contributes to the drafting, evolving and evaluation of service agreements (inter departmental SLAs, external SLAs), so that they remain seamlessly in line with the contracts concluded.

2. Contract and supplier management
Contract management information must be up-to-date and available to those involved. Contract management contributes to obtaining management information, standardizing services and standardizing the procurement process within the Intelligent Customer function.

Contract management covers the following issues.:
- Insight into whether a (legally) valid contract is available for each supplier. For example, whether the contract has been terminated after the acquisition of a supplier or should be extended.
- Management possibilities for the various suppliers through, for example, periodic management reports, evaluations and benchmarks.
- Insight into the risks associated with contracts. For example, where the critical contracts/ contract agreements are for daily implementation.
- Insight into quality, quantity and financial scope *per* contract, as well as per outsourced service and for each LoB. For example, for financial accountability, coordination between contracts, agreements and performance management.

- Insight into who needs to take action at what time. For example, who takes the initiative to reopen a contract, who can contact who at the supplier when something is missing in the service.

3. Market and client and contracting
Contract management maintains relationships with potential and existing suppliers. Control of total costs (TCO, short for Total Cost of Ownership), optimizing business processes, reducing risks and making optimum use of market knowledge as early as possible are the central principles.

Contract management follows developments in the range of services and products closely and uses the knowledge from the market for the timely recognition of opportunities for other and / or better services. It informs suppliers about developments at customers and within the management enterprise. Where digitization is part of the corporate strategy, engaging with suppliers might be the only way to manage skills shortages or technical requirements.

Table 6.2 Activities of contract management.

Ensure delivery of services and products (supply side)	• Contribute to determining business needs and role of IT translate this into a program of requirements. • Participate in the entire procurement process (specify, select and contract) and co-responsibility for legal, financial, enterprise and substantive conclusion of appropriate contracts / covenants. • Review contract (s) /agreements (periodically and during contract period). • Contribute to the preparation and evaluation of SLAs.
Contracts supplier management	• Registration and management of contracts, contract details and agreements. • Monitoring contract agreements, promotions and planning, also one signaling function. • Provide proactive advice on the handling of various contractual matters and the realization thereof. • Coordinate information about the contracts. Analyzing and reporting on realized versus agreed services. • Monitor supplier performance (based on management reports) and measurement results from the supplier) and initiate improvement proposals.
Market and client and contracting	Maintaining client-contractor relationships with suppliers. • Following developments at suppliers (for management / customers). • Informing or sparring / coordinating with suppliers. • Adjusting the suppliers. • Guaranteeing service integration on the supply side.

Service integration must also be guaranteed on the supply side. In addition, suppliers for (groups of) products and services are designated as coordinators for the integral linking of processes or infrastructure. The other suppliers are required to coordinate their products with the designated coordinator. Table 6.2 summarizes the activities of contract management.

6.2.3 Tasks within management control

After the contracts have been concluded, BIMC naturally wants to ensure that the services provided are in accordance with agreements. This responsibility has been assigned to the control management focus area. Three task areas are distinguished:

- service management;
- performance management;
- financial management.

1. Service Management
The influence on the integral costs is greatest in the phase where the management office determines the need (or when drawing up the program of requirements). After that there are limited savings. After the contract has been concluded, influencing the costs becomes high again if changes are made to the specifications within the contract.

From this financial perspective, control management contributes to determining business needs, translating these into a program of requirements and the procurement process or the conclusion of contracts and changes to existing agreements. In this regard you can see how the service management and financial management areas must work together (and do not forget that the task area's might not be independently managed, they may be the task of one person).

Control Management covers all activities performed by BIMC that are aimed at ensuring that the requirements of the contracts are achieved and that the risks for the client remain at an acceptable level. The primary goal here is that management is efficient and effective.

Important elements of a control function are:
- The assessment of the legality and effectiveness of the products and services provided and the analysis of the (financial) risks.
- Determining cost, on the one hand, to enable BIMC to make a realistic budget and on the other, to be able to determine market conformity. On the other hand, customers (and buyers) need insight into the cost of products and services, so that they can make an assessment of whether, and if so to what extent, they want to purchase products and services.
- The analysis of whether the services provided in relation to the cost are still in line with the market. The most obvious methods are cost price analysis and benchmarking.
- The development, management and operation of a quality assurance system.
- Taking care of data management, i.e., the management and supervised updating of various data files, most often undertaken with the Custodian role of DID so that there is clarity and consistency.
- Analyzing the data and taking care of management information from these databases for the purpose of performance management.

2. Performance management
The quality of the service is largely influenced by the quality and reliability of the overall development. Performance management influences productivity, assists risk management, cost control and cost effectiveness. Performance management contributes to:
- Contract fulfillment. To demonstrate whether the delivery is what has been agreed.
- Evaluation of SLAs. To determine whether the services have been delivered that have been agreed with the customers.
- Cost control. To demonstrate whether the agreed services remain within the agreed costs and whether the relationship between price and performance is still correct (test for efficiency).
- To demonstrate whether the supplier has delivered the performance as agreed in the contract and then whether the supplier can be paid.

- Quality improvement. To gain insight into where the quality of service of both the Intelligent Customer and the services that are delivered can be improved.

3. Financial control
This includes:
- Prepare and determine the budgetary framework, budget, budget allocation and such, partly based on the agreed volume and the agreed prices.
- Taking care of financial implementation and accountability, for example with regard to intended spending or policy decisions with financial consequences.
- Invoice handling. This comprises two activities: determining that the performance has been delivered (declaration of performance) and then authorizing the invoice).

Table 6.3 summarizes the activities.

Table 6.3 Activities of management control.

Management	• Assessing the legality and effectiveness of the services provided and analysis of risks, including financial. • Determine cost. • Analyze the degree of market conformity, including by performing cost price analysis and benchmarking. • Develop, manage and operate a quality assurance system. • Structured management and coordination of activities and processes and contribute to monitoring the quality of the services to be provided. • Manage and update data files and maintain the files. • Analyze and report management data.
Performance management	• Aggregate the available information (provided by the focus areas) on the financial performance, satisfaction and performance of the suppliers, analyze it in full and report on it to management. • Make improvement proposals aimed at improving the overall process. • Organize and monitor connections and processes between suppliers (service integration).
Financial control	• Prepare and approve the budgetary framework, the distribution of the budget, the budget and implementation (spending, policy decisions with financial consequences). • Ensure implementation and accountability in the financial field. • Processing invoices.

6.2.4 Tasks within user management

BIMC needs to have good relationships in many areas of the enterprise. For example, the activities of user management focus on maintaining the substantive relationships with users. At the strategic and Tactical level, there are four principal areas of work within user management; the first three are largely strategic, the fourth element necessitates further expansion for the Practitioner, in section 6.2.5, to cover essential operational processes. The four principal elements are;

1. ensuring the delivery of services and products (demand side);
2. guarding business/LoB interests;
3. relationship management
4. operational management.

The Fifth element is of course a movie.

1. Ensure the delivery of services and products (demand side).
The tasks within user management aim to ensure that the needs of customers are optimally aligned with the range of services and to monitor this together with the users through managing results. Needs are translated as much as possible in terms of functionalities. For example, I want to be able to use my smartphone anywhere to process information, instead of *I want a smartphone type XYZ.*

Tactically, BIMC tries to bundle needs as much as possible and to reach a common position through consultation. Specific agreements are only made in those cases where this is not possible. This creates the difference between agreements on generic services, services purchased for everyone, and specific agreements, the so-called customized agreements. In practice, there is another intermediate category that talks about common or 'plus' agreements. These agreements form a category of services that are required for parts of the enterprise but for which it is not clear who is responsible for payment.

2. Guarding customer interests
Consider here the role of the Custodian described in DID; there is a corollary between guarding customer interests generally and the specific role of guarding the integrity of data resources. Where developments have been approved, an estimate is made of what these developments mean for the strategy and the range of information services on offer. Customers are informed about developments in the range of services and products.

3. Relationship management
BIMC uses relationships to surface specific needs (where digitization is a key driver, these may well be technical as well as data driven, remember that BiSL describes the need to cover Business, Information, Services **and** Technology issues). Strictly speaking, relationship management can be said to include Operational management (below) though for clarity, it is worth setting out operational tasks as a separate element.

Case: standard software

Introduction:
In any organization there are a many different software tools. Even if BIMC is involved and takes ownership there might still be challenges. What if your supplier of a software tool includes a link to another tool from another provider. And the issue is not simply related to cloud-sharing software. People inevitably start using tools if they find them useful, but what does it mean to GDPR and what are the implications for a business? IT might not even be aware of these ghost (some businesses describe them as 'rogue') tools.
The issues

There is unlikely to be a contract with the provider of ghost tools (and what about licencing issues…..). What functionality do they provide? How will they handle data? Can they use data for other purposes (maybe without the knowledge of the business)? And if the business identifies a genuine need for using the ghost tools and assume that they are safe and managed, how do we make sure that different LoB do not end up with several similar applications, used for the same functionality, that might not work together.

BIMC

This type of issue is related to the proper design of the information architecture. Business (and IT) use of rogue applications and tools is a major issue and should be controlled by BIM.

4.Operational management

Operational management is particularly focused on monitoring the satisfaction that customers and users have about the nature, quality and extent of the information services. Operational management conducts various surveys and other techniques to establish the degree of satisfaction. Operations also uses the data that arises from handling complaints and disruptions due to production, user management also ensures complaints, incidents/problems and malfunctions are handled satisfactorily. See section 6.2.5 for more information.

Summarizing the user management responsibilities is tabulated for you in Table 6.4.

Table 6.4 Tasks within user management

Ensuring delivery of services and products (demand side)	Make a contribution to determining user needs, and their translation into a program of requirements and the creation of contracts. • Record agreements in service agreements and contribute to the preparation and evaluation of SLAs. • Compiling and managing the service catalogue, the service descriptions and management agreements.
Guarding customer interests	• Ensure representation of the stakeholder interests. • Monitoring customer and customer satisfaction. • Supervision of the handling of complaints and malfunctions Initiating steering measures, changes to the services or changes in strategy or strategic planning.
Relationship Management	Maintaining relationships with users/LoB management. • Follow the needs of and developments of the users e.g. changes in strategy or strategic planning. • Informing, consulting and influencing customers. • Initiate and monitor the translation of customer needs into supply services, including the control of the output. • Discuss advise and develop proposals with the users, negotiate and obtain an order from the customer to proceed with execution.
Operational management	• monitoring the satisfaction that customers and users have about the nature, quality and extent of the information services • manage day to day DID operations

6.3 How to structure BIMC within the enterprise

As we explained in chapter 5, within the enterprise BIMC fulfills the role of the strategic and tactical professional representation of the business that coordinates the business information services to achieve desired business outcomes, compliance with any related contracts and the control thereof and controls costs where applicable. BIMC is positioned between the customer enterprise (business) and the supplier(s), internal and external. It is the intermediary who, as a delegated client, ensures that the client's needs (or the needs of the business) are well served by clear formulation of the needs and the translation thereof into purchased and delivered information services.

To operate effectively BIMC should be aligned to the BIM operational activities.

Keep in mind that BIMC **does not carry out all of the above activities** and most often is responsible only for the tactical level not the day-to-day activities. The tasks and responsibilities mentioned in this chapter must be properly assigned. Implementing it requires a lot of insight, experience, expertise and competences, which are not always present. As Deming[18] notes, it is only by striving for continuous repetition and conscious improvement that high quality can be achieved.

The term BIMC is used to state what needs to be done in order to support management, LoB and users with BIM execution. In order to make this possible BIMC must be expert in the four areas that make up the intelligent customer capability. In many enterprises, you do not necessarily see one department where all the intelligent customer tasks are undertaken together. Sometimes the functions are spread over several departments. It is of course a possibility that only little control is required and implementation will be minimal. The same is true where BIMC adopts the intelligent customer functions.

The intelligent customer functions can be instantiated in several variations. All variants are conceivable: from one person with a universal mandate to a multidisciplinary department (and everything in between). In practice we often see that two dominant criteria are used to choose an organizational model. The first criterion is about whether BIMC focuses exclusively on one or more LoB. The second criterion concerns the mandate. Is there a direct line relationship between the various focus areas, or is it a strategic network of focus areas that are functionally managed? In the last case it means that not all tasks identified are part of the functional BIMC unit but are part of organizational departments that need to cooperate.

[18] Deming, W.E., (1982, 2000), Out of the crisis, MIT Press. Beniger, JR, (1986), The control revolution, technological and economic origins of the information society, Harvard University Press.

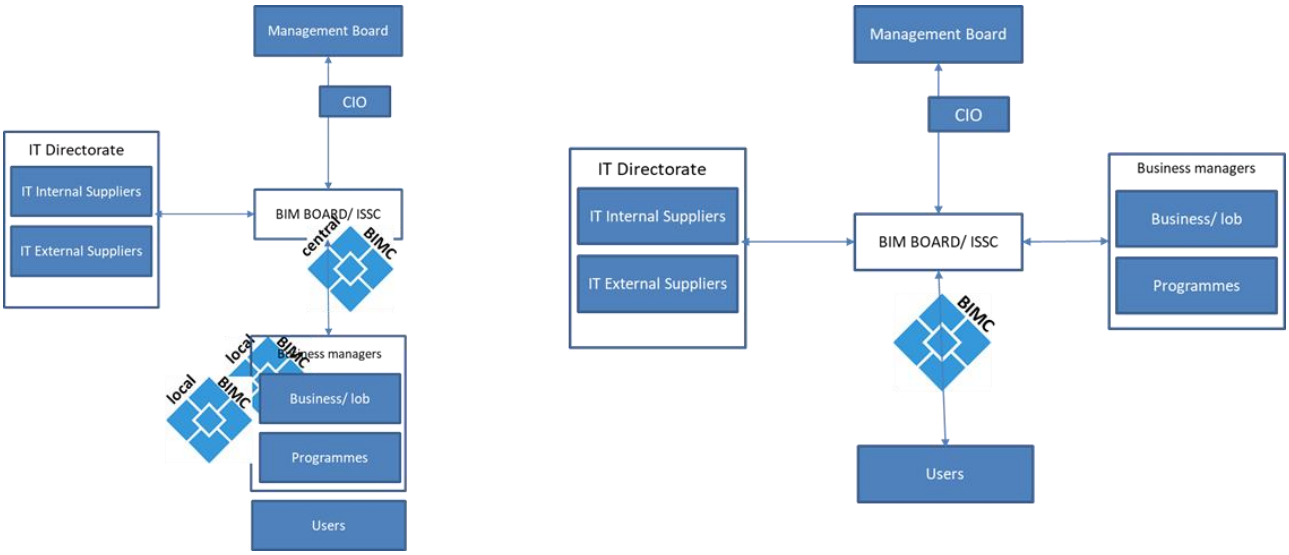

Figure 6.2: BIMC central and local organization

Although, to our knowledge, no further research has been done into this, in practice we see four dominant aspects on the basis of which organizational model for BIMC is decided upon. These are:

- The size of the enterprise. Is the enterprise of a size that it becomes sensible to set up a single department for BIMC, or is the enterprise so gigantic that it is better to organize the areas of attention separately because of economies of scale (or other issues)?
- Complexity of the line for business or process from the primary enterprise. Are the services and information processed between one or more LoB upon inter-related and sufficiently complex to warrant a coordinated approach?
- Homogeneity of the businesses. Are the LoB comparable in terms of maturity level?
- Experience of the enterprise with functional management of BIM. Does the enterprise have knowledge of and experience with functional management related to data and if so, is it effective?

For larger enterprises, a distinction is made between services that apply globally or generically to the entire enterprise and services that apply to a specific domain. In that case it is often decided to make a distinction between management at the corporate level and management at the business unit level. The principles and roles *per* focus area remain the same. However, the coherence and management of generic and specific needs to be properly adjusted.

Again, different variants are conceivable. Figure 6.2 provides an example of a management office at corporate and business unit level that has a clear line mandate.

Testing applications is a serious business

The issue

The external supplier responsible for development and implementation of a replacement motor insurance information system was also contracted to provide a test strategy. BIMC discovered during the development phase that in the test strategy the requirement of the LOB about participation of the user in the testing and implementation of the applications had not been specified. In addition, it was had not been foreseen by the supplier that the complete end- to- end

solution involved a functional and technical end to end test with specially designed data test-packs.

During the contracting phase of the project, these issues had been overlooked by the applications development teams, internal infrastructure team, the senior user on the project board and even by the senior technical teams responsible for database integrity. BIMC also discovered that although in the contract requirements were set for data delivery, the LoB had not been attentive to the functional requirements of the solution where data had to be available to several other external parties that acted on behalf of the enterprise to resell insurance services.

Mindful that testing is not restricted to the application software, BIMC also had to be sure that responsibility for ensuring that the installed hardware and software was available. Necessary arrangements were made with infrastructure teams to ensure processing was functional and that information was processed effectively and accurately in the overall supply chain.

BIMC advice and guidance
As a consequence of the issues discovered, project management advised by BIMC instigated a number of corrective actions to improve and restructure the test process; the actions were implemented immediately to react to the issues discovered and were defined as policy for the future. These included (in this case, because the project was half complete) a revised, comprehensive test document written by the LoB with the supplier to create a more agile process to test requirements and service integration, defining exit criteria to make sure there was a threshold for 'go/no-go' decisions about implementation and go-live, and defining a continuous improvement strategy for the enterprise service organization focused on the needs of the LoB.

Root cause analysis
LOB management had created their own policy of not to allow changes in the application requirements during development and or to the environment in which the new application would be implemented. They had formally issued a 'freeze' notice to the project manager. In practice, reality is that this rarely, if ever, works, especially in a brown field environment. Needs of LoB will change or mutate with the market dynamics. Fortunately, BIMC identified that if the application delivered did not meet up-to-date requirements, it would have been rejected at worst, or endlessly changed in operational use.

Policy advice for the future
The purpose of requirements specification work is to avoid making mistakes and to do complete job. It is not possible to avoid all mistakes and only some US presidents are omniscient. Accepting that there is a risk of being wrong is part of project planning. The essence of the matter is to make sure that your risk management is in place to manage issues as they arise.

A 'post mortem' was instigated by BIMC and the findings reported to the Board to consider. It was accepted that Policy should be issued about exit criteria to define the point where User Acceptance Testing would be finished, and was in line what was needed based on fitness for purpose (even if not all contract requirements were fulfilled). Where contract requirements were unfulfilled, Policy was that the project team would identify such issues and the service organization would take responsibility. As an improvement issue, the service organization would be expanded for a finite time to close all open issues.

For the future, being serious about quality of the test process would be an integral part of the project vision document and the planning process.

6.4 BIMC competences

BIMC can manage on multiple levels of abstraction, terms and scope of service. On the one hand, BIMC advises the enterprise on new developments and helps with policy preparation. On the other hand, depending on the nature of the questions or incidents, BIMC is expected to take the measures that are necessary to guarantee uninterrupted business operations.

The role of BIMC differs fundamentally from Operation that is responsible for the actual delivery of results. BIMC, on the other hand, does not interfere with operational services, but coordinates the supply and demand chain and monitors that chain.

BIMC is placed between the four most important stakeholders. On the demand side, BIMC has to deal with three parties: general management, customers and users. The services are purchased and compiled for users, so that they can perform their work optimally. Based on the needs of users, the BIMC office makes agreements with customers about the price that must be paid to be able to provide the services. The most important customer or client is generally also on the board or in general management, in charge of the portfolio for business operations.

The most important customer is also the party that pays for the generic or basic services. These needs are often laid down in service agreements or (internal) service level agreements (SLAs). BIMC assesses the need and translates these functional requirements into a technical package of requirements that is understood by whoever will design and supply the business services. In doing so, BIMC takes into account requirements set by the management, such as architectural requirements, operational management principles, etc.

In addition, BIMC will also advise the board on topics such as new developments, standardization policy, policy frameworks and costs. BIMC then purchases the service from one or more suppliers. BIMC must be aware of the market, technological trends (particularly in BIM, Digitization and Knowledge/Information/Data management) and developments in society and their significance that may translate into services.
To that end, it concludes contracts, covenants or serviceand experience level agreements (SLAs). The service is delivered to the enterprise (users) in accordance with a product and service catalogue and maintained, for example through service management and a service desk. Based on measurements (audits, satisfaction surveys or panels) and the performance management on the contracts, BIMC gets a picture of the quality delivered. The results are reported back to the general board and the customers. BIMC can also take the initiative to advise users or service providers on new developments.

The consequence of these competences in general terms is that the emphasis of the requested competences is on social-communicative and intellectual competences. This is in contrast to, for example, the enterprise that has implementation in-house, so that the emphasis is more on administrative-enterprise, emotional and task-oriented competences.

- Specifically, this requires the following of the demand side of the Intelligent Customer guidance.
- People feel personally responsible for the relationship with internal customers.

- Complaint handling is effective.
- Communicate with all management levels and departments in an enterprise.
- Think like the customer, make proposals to the customer for alternatives and a new approach to problems. Personnel should empathize with customer needs and express the wishes of the customer in their own language.
- Identify any underlying question and give specific advice.
- Take initiative in building a network within the enterprise based on trust and expertise and know who are the most important/ influential people.
- One can establish relationships between developments in society, politics, governance, the professional field and the future needs of the enterprise and advise about the trade-off between theoretical solutions and practical feasibility.
- Substantive knowledge of subjects or the ability to identify subject matter expertise.
- Knowledge of and experience with project management and skilled in managing multidisciplinary teams in projects (mostly technical, logistical, legal and financial-economic disciplines) and disseminating new ideas and concepts in such teams.

6.5 How many people are needed in BIMC?

Looking at the competenences of a BIMC one asks himself how many people need to work within BIMC? One hundred and three. No wait, that's not very agile, let's have seven. Look how agile we were there, we reduced management overhead by ninety six and yet have no clue how much work is actually needed, that is the beauty of being agile.

More seriously, the answer depends entirely on the size of the tasks being undertaken as well as the size of the enterprise. BIMC should coordinate and assist with the implementation of all major programs, not only a specific BIM program, to realize the enterprise objectives regarding information/data and monitor the results. This includes the strategic advisory role. BIMC is positioned between supply and demand. In terms of BIM, what (and who) is the need behind the demand for data and what (or who) will supply that data.

It is worthwhile thinking about sizing the function initially from a 'global' perspective and then (because this book is about BIM) specifically thinking about BIMC in your enterprise. We need to consider the size because the Intelligent Customer is defined independently of implementation. It may therefore be that large parts of the actual implementation, such as programming work or technical maintenance, are included within the enterprise, for example as a separate department. If everything is outsourced, a core staffing that suffices a few basic functions will suffice. Outsourcing often refers to a rule of thumb of 8 to 12% of the outsourced amount as structural costs for managing contracts. However, this can be considerably lower if there is main contracting. It can also be considerably higher when it comes to vital systems or safety-critical systems. We often see a ratio of 1 FTE internally to 3 FTE externally.

The maturity of the demand enterprise (business) and the maturity of the providers also influence the size. The more mature the demand enterprise and the providers function, the smaller the management enterprise. Or vice versa: the worse they function the more coordination is needed.

One more point; quite often the need for more people is met with the response that something is 'not very agile' or that 'it needs too many people'. Well, did anyone actually quantify the work that needs to be done? If there is no need for work (or a process) then of course anyone working on that activity is a waste of resources. However, if an activity has value, then it should be properly

resourced and that value might well pertain to the ability of an enterprise to transact business based on data. In which case (depending on need), 100 people working in a pyramid management structure might well be considered 'agile'.
And you do not often hear about Google, Microsoft, Facebook, or any other data hive complaining about having too many people looking at data. If a service is free, you are the product. Or as they say in the USA ``TINSTAAFL'', which is short for there is no such thing as a free lunch.

Key points

BIMC will support business managers, IS planners (governed by some form of BIM board/ IS Steering Committee, the ISSC) and program directors in translating the Policies of the Management Board (guiding principles) into purpose and direction for the managers of IT services.

BIMC fulfils a bridging function between the demand from the enterprise and the supply from the service providers.
BIM is therefore that BIMC operational management may be different for each enterprise, but that the ingredients that every enterprise can choose from are comparable.
To cover essential operational, day to day processes. BIMC must be able to: make agreements with enterprise business users, translate the work into a standardized approach where practical, negotiate with service providers, and always check on performance.

To manage these activities BIMC will have four responsibilities:

- policy, innovation and advice (PIA) management (Plan, mostly Governance in the DID model),
- contract management (Do, mostly Strategy in the DID model),
- control management (Check, mostly Improvement in the DID model)
- and user management (Act, clearly the Operational focus of the DID model).

BIMC must be expert in the four areas. Thus BIMC is placed between the four most important stakeholders. On the demand side, BIMC has to deal with three parties: general management, customers and users. On the supply side with relevant suppliers.
In many enterprises, you do not necessarily see one department where all the intelligent customer tasks are undertaken together. Sometimes the functions are spread over several departments.