

Order from Chaos

Ian Dalling presents a management classification to allow all of an organisation's operations to be defined within twelve management procedures

Anyone who attempts to design a fully integrated management system is confronted by a very large number of management elements that need to be arranged in a logical and orderly way. We have all experienced the feeling of arriving in an unfamiliar supermarket that could be stocking 30,000 products and needing to quickly locate something. Despite the store's logical design we invariably end up asking for directions because there is variation across stores. Designing a fully integrated management system is similar in many respects, but although management elements probably only run into hundreds rather than tens of thousands, we must also face the additional complexity of their interrelationships.

Integrated management systems need to control and guide an organisation's processes in a fully coordinated way to ensure that stakeholders' needs and expectations are equitably satisfied. To achieve this aim, many design principles need to be simultaneously applied. This article will focus on one particular aspect: management element taxonomy, which involves uniquely identifying and defining management elements and then arranging them in a logical and orderly way. In this manner, there is not only a place for everything, but the relationship between the elements becomes as visible as possible. It is not dissimilar to the ongoing work done by biologists to document evolutionary relationships, initiated by Charles Darwin. However, management element taxonomy is not constrained by such precise rules and arguably is independent of space and time.

The management element taxonomy presented in this article has been applied and tested by the author during the practical design and implementation of fully integrated management systems complying with multiple management system standards such as ISO 9001 (quality), ISO 14001 (environment) OHSAS 18001 (occupational health and safety), ISO 17025 (measurement) and management legislation such as the Management of Health and Safety at Work Regulations and the Control of Design and Construction Management Regulations. However, any management system standard, legislation, code of practice or regulatory license can be readily mapped onto the structure.

The taxonomy comprises 12 principal elements and forms the top of a hierarchical structure with subordinate layers comprising clusters of related entities that need managing. It is presented to stimulate interest and research in this subject that is critical to the performance of integrated management systems.

Taxonomy principles

Just like building architecture, management system architecture needs to be both functional and elegant and there is infinite potential for variation. It is possible perhaps that more than one ideal management element taxonomy could exist, but it is highly desirable to adopt a single universally accepted convention to help create orderliness within and between organisations that are now interacting locally, nationally and globally.

The following design principles were followed when creating the taxonomy:

1. Hierarchical element structure
2. Plan-Do-Check-Act embedded
3. Reflect theory and practice
4. Distinct non-replicated element characteristics
5. Element clusters facilitate generic control and guidance
6. Elements facilitate simple interrelationships
7. Inclusive element scopes
8. Universal, concise and intuitive element titles
9. All organisational structures and dynamics covered.

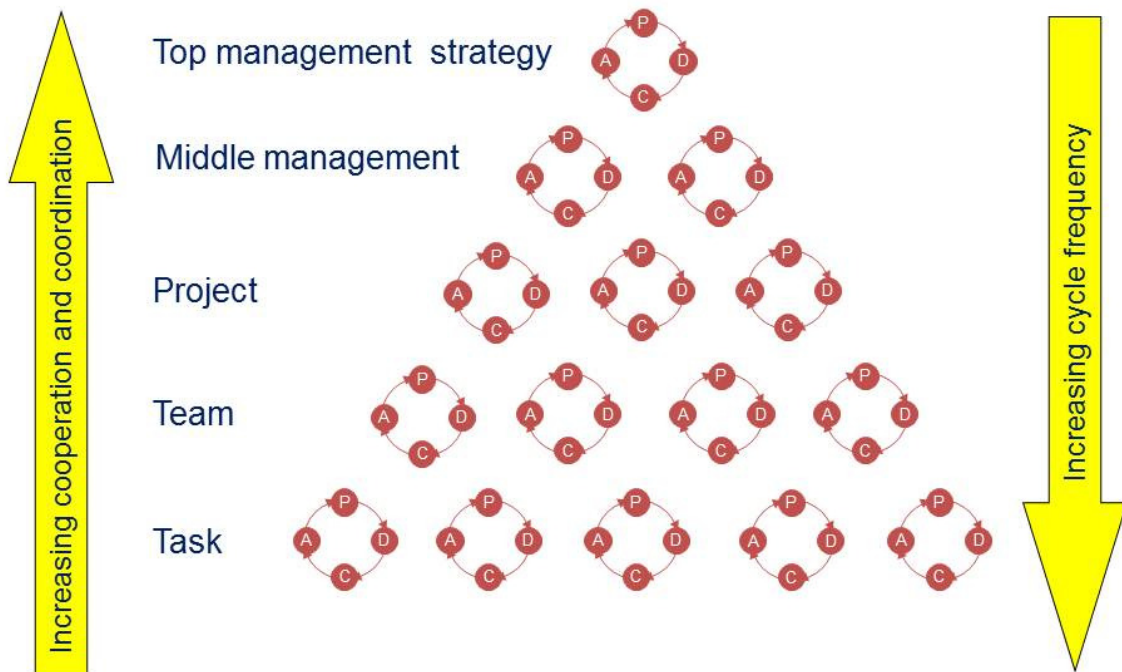


Figure 1: Plan-Do-Check-Act

A full explanation of these interacting principles cannot be covered here, but it is worth noting that plan-do-check-act is deemed to operate throughout an organisation at every level from top management down to task level as shown in Figure 1. PDCA is a universal principle that can be applied to manage opportunity and risk and any aspect of organisational performance including quality, environment, health, safety, reputation or finance. PDCA is also a natural principle that we all follow in our everyday lives. We all plan to some extent before we do something, we check while we are doing it to ensure it is successful and finally we evaluate what we have done to try to do it more easily or successfully next time. This is the basis of all experiential learning. The challenge of management is to apply PDCA successfully at the scale of the super-organisms that we refer to as organisations. In organisations PDCA does not happen naturally and requires conscious organisation.

The 12 elements

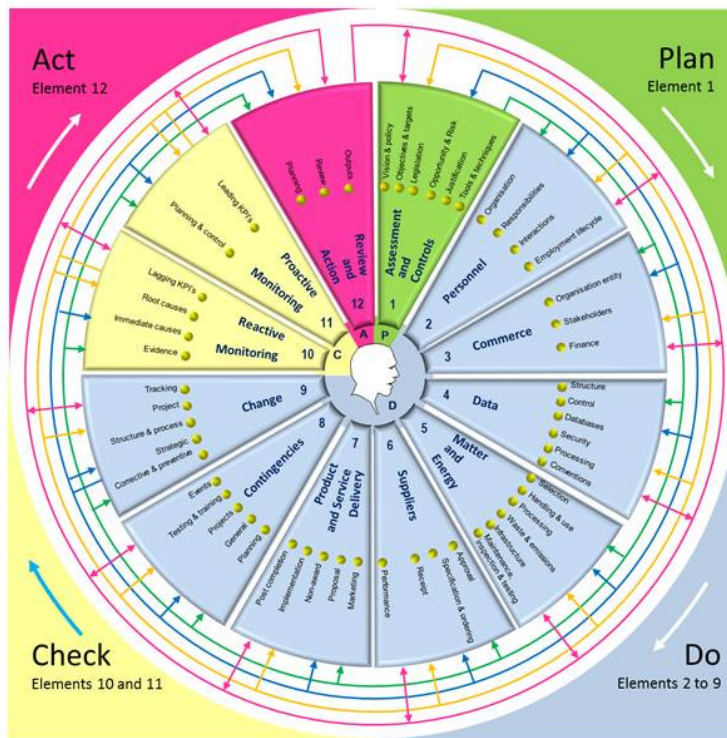


Figure 2: Twelve Elements of the Management Topic Taxonomy

The 12 principal universal elements of the management element taxonomy are shown in Figure 2 with human consciousness pivotal at the middle and spanning PDCA. Although some of the elements appear to be tangible, their management is a construct within the consciousness of the manager. The manager or management team perceives, thinks and acts on the level of their individual or group consciousness – what is written is only a record.

Application of the principles defined above has resulted in the PDCA cycle components being assigned to the 12 elements as follows.

- **Plan (element 1)** covers the analysis and synthesis required before the execution of the task or process
- **Do (elements 2 to 9)** comprises eight elements each defining a specific area requiring control and guidance, eg people, commerce, data
- **Check (elements 10 and 11)** comprises both reactive and proactive monitoring elements. Reactive monitoring involves the reporting and analysis of events that may also include near misses that could have resulted in significant loss or gain to the organisation or its stakeholders. Proactive monitoring involves activities like audits, inspections or benchmarking which provide confidence that planned arrangements have been implemented and are working satisfactorily. Reactive and proactive elements are both important and provide data for lagging and leading key performance indicators respectively
- **Act (element 12)** covers the review of all aspects of the organisation's performance and assigned actions to drive continual improvement.

Figure 2 shows the main 12 elements at the top of the hierarchy and also the second level which aids understanding of scope of the main 12 elements. However, the hierarchy has been developed to several subordinate levels and it is not practical to show them all within Figure 2. However, Figure 3 displays the full people element hierarchical structure and gives an impression of what the overall taxonomy is like.

All of the elements within the taxonomy at any level are capable of universal application. There are no residual issues requiring separate attention within dedicated quality, health, safety or environmental management arrangements.

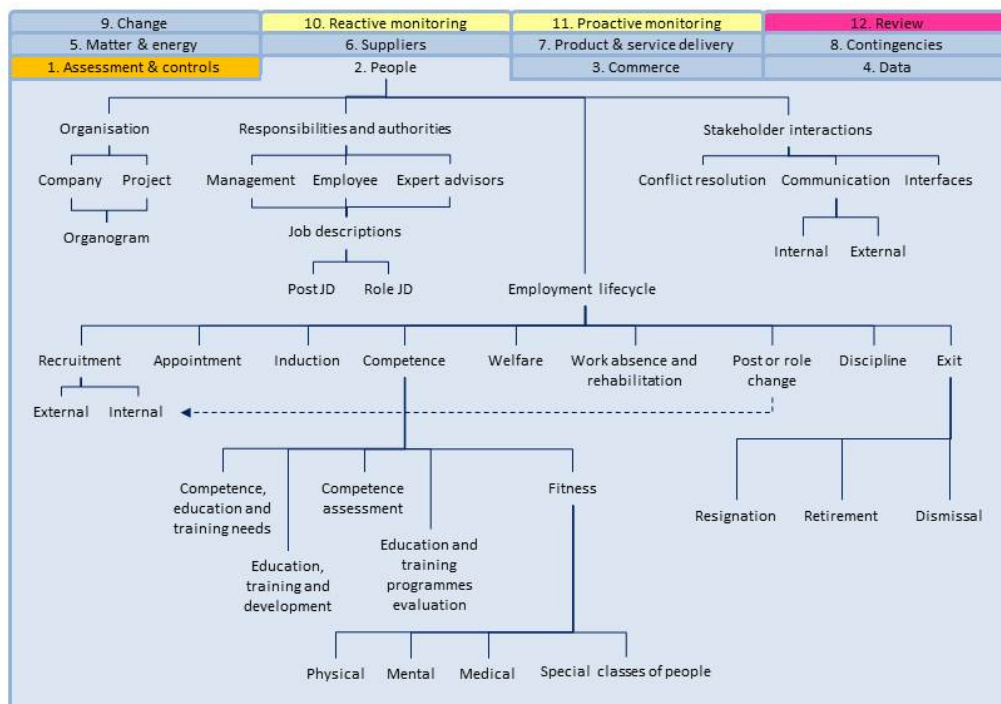


Figure 3: People Element Hierarchical Structure

Element interrelationships

Although the structure shown in Figure 2 and Figure 3 are static, they define the dynamics of the organisation's processes. This is analogous to the design drawings of a clock which determine how a clock should be structured. It is only when the clock is set in motion that the process communicates the passage of time. A clear understanding between the structural and dynamic aspects of organisations and their mutual interaction and dependency is essential to a proper understanding of the application of integrated management principles. Structures host processes and the creation, maintenance and destruction of structure occurs only through natural or man-made processes. Structure and process mutually coexist and interact and together impact the needs and aspirations of stakeholders.

Each of the top 12 elements has a particular relationship with the other 11 principal elements and amounts to 66, excluding any interrelationships between elements at the subordinate levels. This gives an indication of the complexity of the dynamics of organisations. The following describes some of the dynamics that naturally arise from the taxonomy shown in Figure 2.

In addition to the interrelationships, it should be noted that many of the elements have a self-referral nature, ie they not only have relationships with other elements but due to its inclusivity the element has a relationship with itself. For example, "change" (9) not only controls the change of the other 11 principal management elements but it also manages the change of the "management of change arrangements".

Element 1: Assessment and controls comprises analysis and synthesis processes to ensure successful organisation processes and defines controls that are implemented in the next eight elements covering people [2], commerce [3], data [4], matter and energy [5], suppliers [6], product/service delivery [7], contingencies [8] and change [9]. Planning is a critical activity that is essential to success, but it can be a very complex process depending on the nature of the organisation or project task and needs to be performed appropriately. It may involve the application of many management techniques (or tools) such as risk assessment. Some organisations may also be

required, by stakeholders, to produce a structure/process justification, e.g. safety cases for major hazard plants, justification of measurement processes in laboratories and submissions to planning or licensing authorities. These are effectively structured arguments supported by evidence providing a required level of confidence. Many organisational failures have occurred due to a failure to properly evaluate the risks during planning processes. The recent operation of the banking system which nearly resulted in the total collapse of the global financial systems is an obvious example.

Element 2: Personnel are the most important asset of any organisation and this element covers their management including: organisation, responsibilities, authorities, communications, stakeholders, conflict resolution and the complete employment lifecycle from recruitment through to exit. It contains some of the highest risk issues that organisations have to manage such as recruitment and ensuring that people are competent for their posts and roles.

Element 3: Commerce comprises the control of the maintenance of the organisation's existence e.g. as a legal entity, the relationships with its internal and external stakeholders via contracts and interface agreements and finance. These three sub-elements control trading processes and the commercial performance of the organisation. Again considerable risk is managed within this element and would have been addressed during planning (element 1).

Element 4: Data covers the controls required to manage the lifecycle and evolution of data in all of its various forms. Document control is included in data control and is another example of the inclusiveness of the management elements. Sub elements include; data structures, control, databases, security and its processing. It should be noted that 'data processing' has accounting as a sub element which in turn has different aspects of accounting as further sub elements. There are many facets of accounting that need to be applied to processes and as each involves value it makes sense to view this from an integrated perspective.

Element 5: Matter and energy includes everything that is naturally created or man-made, including energy, except where it is already addressed by the other elements such as "people". Einstein's equation $E=MC^2$ justifies this natural element grouping. Sub-elements cover the lifecycle management of materials, products and infrastructure. Critical process steps are normally defined in (safe) systems of work and failure can account for major organisation losses, for example, the Piper Alpha oil platform disaster in the North Sea in 1988 killing 167 people.

Element 6: Suppliers covers the lifecycle management of suppliers from initial approval, taking an opportunity/risk informed approach, through to performance evaluation and grading.

Element 7: Service and product delivery covers its lifecycle from marketing to post-delivery evaluation.

Element 8: Contingencies includes the arrangements that are needed to mitigate risk after there has been a failure of the organisation's core or supporting processes and includes such things as emergency and crisis management. Emergency procedures may use a symptom-based approach where diagnosis is a key aspect of the process. The objective is to return to normal operation with minimal loss.

Element 9: Change embraces all types of significant permanent or temporary change within the organisation, for example corrective action, preventive action, strategic change, structural change and experiment. An ill-conceived experiment resulted in the Chernobyl nuclear power plant disaster in the Ukraine in 1986 and is estimated to eventually result in 4,000 deaths. More recently, the Toyota car company failed to effectively control its strategic management policy and lost the knowledge and expertise that once made it a world-class leader. Plan do check act is the basis of this cyclic process of learning and failing to keep it up effectively results in a corporation losing its knowledge and competence.

Element 10: Reactive monitoring covers accidents and incidents and near-misses including customer complaints. The process includes the collection of evidence, determining immediate causes and root causes so that improvement can be achieved via element 12 'review and action' and element 9 'change'. Root causes can be classified using the 12 element taxonomy.

Element 11: Proactive monitoring comprises audits, inspection, surveys and benchmarking.

Element 12: Review and action covers the systematic review of all aspects of performance and internal and external change, and assigns actions to drive continual improvement. These processes are normally conducted within a hierarchy of meetings conducted at different frequencies.

Element synergy

The controls and guidance that may be defined within a management system can be associated with any of the 12 elements and may range from a defined structure or process boundary to a precisely defined structure or step-by-step process. Thus a broad principle can be defined, for example "superseded data will be segregated or destroyed". Alternatively a detailed and precise process map can be defined that includes all of the steps that are critical to a task's outcome. A good management system will normally use both approaches. A management system directs, supports and nurtures the repeated application of identified best practice. Because it is based on PDCA, it acts as a continual learning cycle for organisational learning and capture of explicit knowledge.

Organisational failures nearly always have multiple contributing causes and it is possible that weaknesses emanating from several or even all of the 12 elements can collectively cause an event. Events often occur at a particular time because weaknesses in multiple elements manifest simultaneously. Accident enquiries tend to repeatedly list the same recommendations or principles and these can all be mapped to the management element taxonomy.

Nearly all major loss events have an impact on total performance, including quality, health, safety, environment, financial and reputation. It is the same operational processes that result in the event making it essential that planning, control, monitoring and review processes are integrated. This allows the creativity of competent personnel to fully focus their attention on the totality of issues and deliver optimal solutions using joined-up thinking. Elements are like a chain where the overall integrity depends on the performance of every link. Excellence in one management element is unlikely to compensate for weaknesses in another.

Application

The 12 element management taxonomy can be used to structure integrated management systems for any organisation, irrespective of type and size. It is interesting that some of the applications of the elements vary very little across organisations while others vary considerably. The same arrangements for people (2) and data (4) can be applied almost universally across organisations. However, the commercial arrangements (3) and product/service delivery (7) which both act to characterise an organisation are usually unique but can be very similar within an industry sector. The management element taxonomy provides useful information on the tacit knowledge and assistance that a particular organisation needs to have either in-house or accessible externally via a consultant. Some aspects of a management system can effectively be taken out of a box while there are others that need to be individually designed to match the nature of the particular organisation.

The management element taxonomy can be used to structure any organisation or project management manual or set of management procedures and benefit any organisation irrespective of size, type or private, public or third sector. However the management element taxonomy has the potential to be universally applied to the structuring of management standards, legislation (overall structuring as well as individual statutes and regulations), licensing arrangements, databases, records, key performance indicators and dashboards, root cause analysis, problem-solving, education and training programs, knowledge structures, artificial management intelligence and research planning. With the right vision and commitment, the global application of management at every level could become significantly more simpler and unified. How we end up managing could be significantly different from how we have managed in the past.

Biography

Ian Dalling, MCQI CQP, is director of Unified Management Solutions and chair of the Chartered Quality Institute Integrated Management special interest group. He is currently assembling a task team to produce a universal management standard that will be accessible via the internet as freeware. If you are interested in participating in this project, please email iandalling@live.com