The Core-Periphery Approach to Management of Public Information Systems

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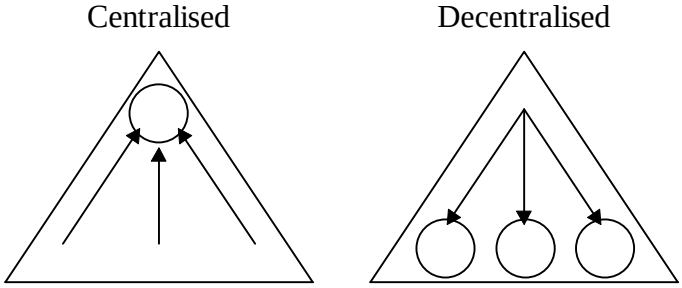
Public sector IT managers face problems resolving the conflict between two approaches to information systems management:

- *Centralised*: where decisions are taken at the most senior or central level.
- *Decentralised*: where decisions are taken at some level lower than the most senior; typically by individual work units within the organisation or even by individual staff.



Centralised IS Management

Senior public managers particularly like the promise of centralised approaches, which can bring benefits of:

- *Resource sharing*: especially the cross-organisation sharing of data, technology and staff.
- *Duplication avoidance*: since, for example, any item of data is stored once and only once.
- *Learning and control*: because these have a central organisational focus.
- *Scale economies*: for both external purchases (hardware, training) and internal processes (system development, management).

Notions of joined-up government have put centralised approaches firmly onto the public sector agenda, but barriers to centralisation are well-entrenched. They include:

- *Technical barriers*: that make interconnection between existing systems complex.
- *Resource barriers*: since centralised approaches require an overt, 'up-front' commitment of money, time, people, and skills; all of which are in short supply.
- *Political barriers*: that make public servants unwilling to let "our data" or "our systems" become "the organisation's data" or "the organisation's systems".

- *Structural barriers*: that prevent the different parts of the organisation working together. In addition to the structural 'stovepipes' that beset government, stereotypical structural chasms still persist between: top managers who fail to understand information and IT; IT staff who understand technology but not the organisation's business; computer illiterate staff who still feel threatened by new technology; and computer literate staff who want to pursue their own agenda without central interference.

Even if centralised management of information systems can be pushed through, it represents no panacea for government since it binds the public sector ever-tighter with thick 'electronic concrete'. The result is more time-consuming decision-making on IT, inflexibility to meet the needs of users and of future environmental changes, and greater dependence and vulnerability.

Decentralised IS Management

Decentralised management, of course, promises to avoid such disadvantages. Driven on by ever-increasing performance/usability:price ratios being delivered to the desktop, this is in synchrony with the push for greater autonomy of work units and greater individual responsibility in the public sector.

It promises to deliver:

- *Greater fit between systems and local needs*: by reducing the 'distance' between users and IT managers.
- *Higher usage of computerised systems*: especially where end users make a significant contribution to system development.
- *Faster system development*: for the same reasons.

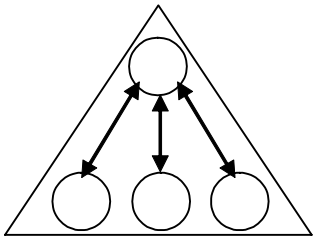
Yet, the decentralised approach too is hard to implement given heavy investments in existing central systems, the lack of skills to support decentralised approaches, and the (sometimes covert) antagonism of many senior staff. It can also be expensive and chaotic, leading to higher-than-desirable costs and a lower-than-desirable scope of public sector processes.

Resolving Contradictions Via the Core-Periphery Approach

Both the centralised and the decentralised approach can provide benefits for public organisations. Yet, at the same time, such approaches can be hard or impossible to implement, and can produce serious disadvantages for the organisation.

What is the way out of this quandary? One way forward is the adoption of a 'core-periphery approach' that attempts to reconcile the push of centralisation with the pull of decentralisation. It does this in two ways. First, through *integration*: drawing the centralised and decentralised approaches together into some kind of unified or compromise approach. Second, and more commonly, through *division*. This accepts that both centralised and decentralised approaches will be found, and then attempts to set some demarcation lines that will keep the two separate, thereby allowing both to be accommodated.

Core-Periphery



A decentralised approach may be most *economic* for public organisations, because it saves on overt input costs. A centralised approach may be most *efficient*, because it avoids waste and duplication. But a successful core-periphery approach may be most *effective*, because it can simultaneously provide:

- the control necessary to share key resources (including data), to avoid duplication, and to achieve economies of scale; and
- the freedom necessary to meet user needs, and to overcome blocks to IT usage and IS development.

The Core-Periphery Approach in Practice

What does all this mean in practice? In each of eight identified areas of public sector IS responsibilities, a core-periphery approach will now be described.

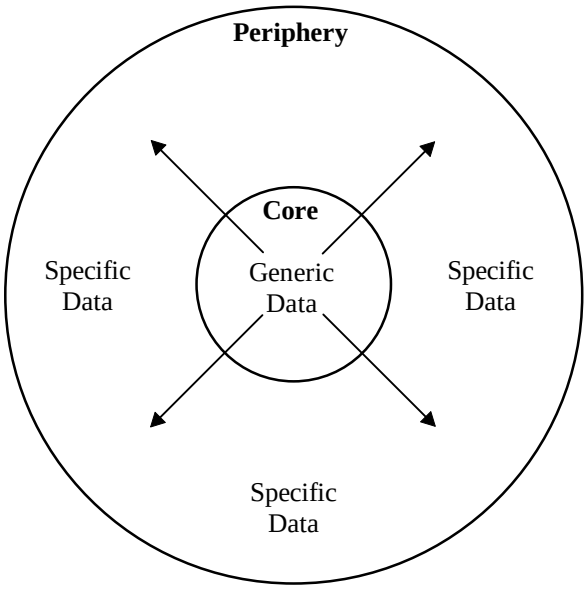
IS Planning - A core-periphery approach to IS planning involves strong and active participation of users and local units in the formulation of strategy. The planning process may then involve decisions about other elements of the core-periphery approach (see below): planning which data items are generic and which are specific; dividing out responsibilities for information systems development; and so on. In line with other core-periphery elements, such plans may also aim to guide more than dictate.

Organisational Structures and Staffing - A core-periphery approach may involve a separation of central and local responsibilities, as described below for areas such as data management and IS development. However, another strand can be an attempt to close the 'structural chasm' between staff identified above. For example, there is likely to be some central IS (not IT) unit with a co-ordination role. It may have a management structure that involves end users and senior staff as well as IT staff. It may be underpinned by a relatively open philosophy that looks outside the unit and genuinely regards the end users as its customers. It may seek to develop *hybrid staff* who understand both the context and work of a public sector organisation *and* the role, management and jargon of information systems.

Data Management - A core-periphery approach to data management typically involves a division of responsibilities, as illustrated. This division defines the centre's role as being the management of 'generic' data items used across all or most of the organisation, such as employee, finance, project and service delivery data. The periphery's role would be to:

- make use of generic data,

- alter generic data only within certain centrally-determined limits, and
- control 'specific' data items used only by individuals or small groups.



Computing and Data Management Architecture - Client/server - adopted by vast numbers of public sector organisations - is a classic core-periphery architecture, with its division of power and resources between the server core and the client periphery.

Information Systems Development - A core-periphery approach to systems development can involve a division of responsibilities. For example, it may define certain types of information system - mission-critical, cross-departmental, technically-complex - as suitable for central development. All others will be deemed suitable for decentralised/end-user development. Core-periphery can also mean sharing or dividing responsibilities for development of an individual system between users and central IT staff.

IT Acquisition - A core-periphery approach to acquiring information technology typically involves a mixture of 'carrot and stick': encouraging users to follow standards, and providing some limited sanctions for those who do not. It also typically involves a flexible approach to standards that allows users some local leeway within a set of boundaries, possibly with 'opt-in' or 'opt-out' norms. Options include:

- reserving certain purchasing decisions (e.g. server and network hardware) for the centre, but decentralising the rest;
- limiting the size of decentralised IT budgets;
- setting central specifications but allowing free choice of model and supplier;
- setting organisational standards on a committee with strong user representation.

Training - A common core-periphery approach is to centralise the planning of training for core information systems. Other training needs may be met, as requested, by end-user support centres or by informal training methods. There may also be central provision of access to open and flexible learning systems such as CD-ROM- or Internet/intranet-based training packages or videos.

Technical Support - Given the very specialist nature of many repair and maintenance tasks, there are very high costs in leaving them to individual end users. Many organisations, therefore, have at least one IT support employee per department who takes on this role. Centralising this role even further can lead to response times and prioritisation that seem poor from a user perspective. However, the more specialised the role, the more the arguments for centralisation.

Finally, though, one must recognise that decisions between centralised, decentralised, and core-periphery approaches do not just depend on objective rationality. Instead, they will be determined by an equation that includes:

- the current status of resources and organisational structures;
- past experience (good or bad) with one or other approach;
- external pressures;
- internal politics.

In the last case, senior managers often find themselves the ultimate arbiters between IT staff seeking centralisation and mainstream staff seeking decentralisation. Their innate preference may be for centralisation. However, in practice, the more senior managers can be open-minded about the issues described here, the greater the chance for an approach that is both feasible and beneficial for the organisation.

More details can be found in the following online working paper: **Centralised vs. Decentralised Management of Public Information Systems: *A Core-Periphery Solution***

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