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Aggregated operational instructions as workflows

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Abstract

Workflows can aggregate the operational instructions of managed processes into a 'high level' view, at the strategic level of understanding and appreciation.

1 Introduction

Operational instructions for the implementation of managed activities (e.g. projects) are — or at least *can* be made — quite detailed, including tasks, methods, team members, deadlines, materials, deliverables, occupation of infrastructures, and much more (Perdicoúlis, 2013d). Without disregarding the value of detail, in certain circumstances it would be convenient to 'zoom out' and obtain *aggregated instructions* that would allow for a strategic-level understanding and appreciation — for instance, regarding anticipated benefits or required skills.

2 Terms and tiers

Activity[1] — the *concept* that things are 'happening' or 'being done' (Perdicoúlis, 2012a) — can be attributed to various actors, including humans and nature. Two specific aspects, *actions* (e.g. what is being done) and *states* (e.g. what is being achieved), are pre-eminent in most endeavours of scientific, engineering, or economic nature.

Considering actions and states[2] in a *sequence* establishes a 'process'[3], which can be 'natural' (e.g. geological changes) or human-made (e.g. engineering projects). When studied and documented, processes are conveniently represented in diagrams — for instance, in concise process diagrams (Perdicoúlis, 2010, CPD, pp.67–70).

In a human-only context, *managed* processes are known as 'operations'[4], and require comprehensive descriptions to accommodate the associated information (e.g. resources, timings). This detailed information can be conveniently accommodated in extended process diagrams (Perdicoúlis, 2013a,

[1] From *agere* [L], to act, to do; originally from ἄγειν [Gk], to drive, conduct — *cf.* strategy, pedagogy, demagogy.
[2] An alternative grouping is 'tasks and stages'.
[3] From *pro* [L], forth + *cedere* [L], to go.
[4] From *operari* [L], to expend labour on — *cf.* *opus/opera* [L], work/-s.

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EPD), personalised process diagrams (Perdicoúlis, 2013b, PPD), or Gantt charts (Perdicoúlis, 2013d).

Operations are used in a wide field of activities such as military, medicine, and engineering, and this creates 'styles' of varying rigour and terminology. Regarding the all important *instructions* for the implementation of operations, there are choices among synonyms such as *procedure*[5], *method*[6], *protocol*[7], and *workflow*[8] (Figure 1).

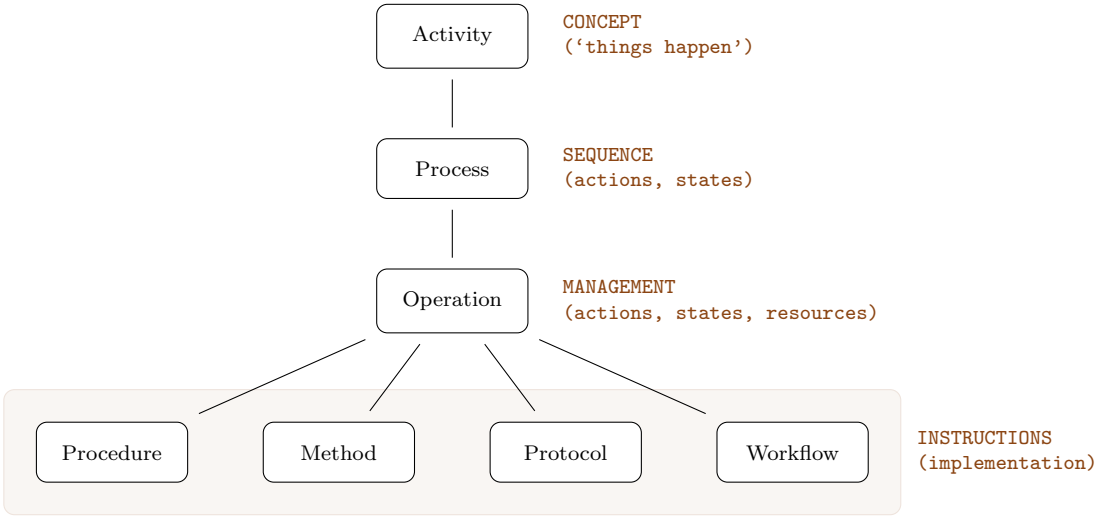

FIGURE 1 Activity-related terms and their distinctive features

3 Candidates

Seeing less — just the essentials — focusses better on what is important, avoiding distraction by detail. The quest for simplification by aggregation of information leads to a higher-tier view of action, well into the realm of 'strategy' (Perdicoúlis, 2014a). Certain techniques are known to produce 'overview' sequences of products and/ or services — e.g. *roadmaps* in a 'state-sequence' configuration, or in a 'strategy' configuration featuring 'state–action' pathways (Perdicoúlis, 2012c). However, roadmaps are often genuinely strategic: they are conceived 'top-down', and they have not been implemented, worked out in detail, or tested yet.

From the instruction set of Figure 1, *workflows* are perhaps the most likely to reach the abstraction of roadmaps, but from the level of detail. This capability is attributed to the relatively recent history of workflows (Aalst et al., 2003, 2005; Deelman et al., 2009), as well as their association with project management and business processes. Workflows exhibit sufficient flexibility and 'practical' spirit (i.e. *work* + *flow*) to allow, for instance, for the separation of the 'flows' of actions, products, services, or documents, or for an adaptable definition of 'work' to accompany volatile external conditions such as the availability of resources and the prices of raw materials.

[5] From *pro* [L], forth + *cedere* [L], to go — the same etymology as in 'process'.
[6] From μετά [Gk], after, behind + οδός [Gk], way, path; literally, 'returning to the [known] path' or 'marking a path [to find it again]' (Perdicoúlis, 2011, p.17).
[7] From πρώτος [Gk], first + κόλλα [Gk], glue; literally, indicating the physical attachment and display of something (e.g. an index or a set of rules) at a prominent locale.
[8] From *work* [En], tasks to be undertaken + *flow* [En], a steady, continuous stream.

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The most prominent operational instruction terms featured in Figure 1 have roots and a lengthy use in formal and demanding environments: 'method' in science, 'protocol' in public administration, and 'procedure' in medicine and engineering. Carrying the gravitas associated with their celebrated use, they propagate or instigate a culture of rigour — and this leaves them little margin for deviation from the established norms and expectations. Hence, it is worth overlooking the 'method', 'protocol', and 'procedure' options for the aggregation of operational instructions, and consider 'workflows' instead.

4 Examples

4.1 Artwork folios

The register of the Systems Planning℠ Artwork Folios (Collection) includes a workflow description that explains succinctly how each artwork was prepared — for instance: 'diagram typeset with TikZ in LaTeX; post-processed in Pixelmator™' (Figure 2).

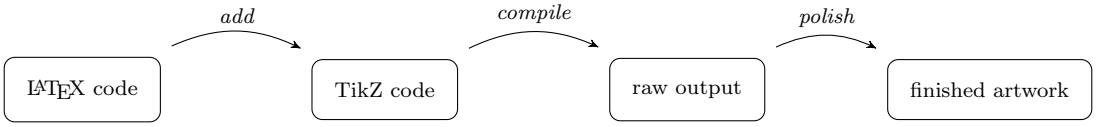

FIGURE 2 Graphical interpretation of the workflow suggests coding and graphical editing skills

While the exact instructions in each software are not revealed, the information is sufficient to convey that the artwork was (a) produced by digital typesetting (LaTeX and TikZ), as opposed to a WYSIWYG[9] method, and (b) post-processed by graphical software to give its finished look.

4.2 Workshops

The prospectuses of Systems Planning℠ workshops such as *Impact tracing*™ (Perdicoúlis, 2012b) present the work to be carried out by the workgroups in the form of a workflow (Figure 3).

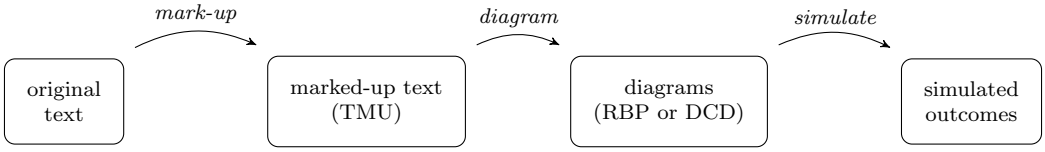

FIGURE 3 Simplified flow of the work to be carried out over four (4) hours

Besides its utility for time-management during the sessions, the workflow is also advantageous for the preparation and delivery of the workshops: the instructor can establish and oversee a single line of work (Figure 3), which will then be personalised by each workgroup with the methods and techniques of their choice (Perdicoúlis, 2012b).

[9] Acronym of 'What You See Is What You Get', indicating the production of text and/ or graphics directly using a graphical user interface (GUI).

4.3 Planning paradigms

A succinct representation of what Systems Planning℠ does — and, quite importantly, 'how' — could be conveyed in a single workflow, but is understood and appreciated better by *juxtaposition* to alternative practices such as the 'mainstream' (Perdicoúlis, 2015). Hence, Figure 4 displays two planning paradigms, above and below a common workflow divided in phases, and prepares for two comparisons: (a) of each paradigm against the actions or expectations of each phase, and (b) of the two paradigms against each other.

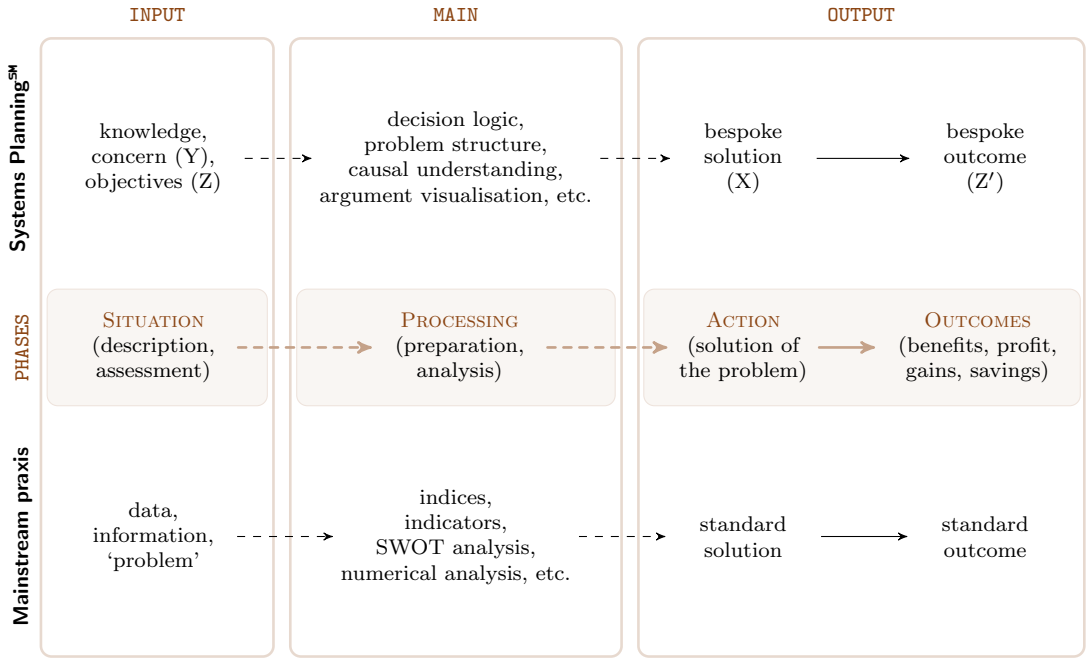

Figure 4 Contrasting workflows of Systems Planning℠ and mainstream praxis

Figure 4 presents the workflow as an *abstracted* process, featuring only states and concealing the work necessary to transition from one state to the next — *cf.* Figures 2 and 3. This reduces the amount of information to the essential, providing an appropriate setup for the comparisons.

The workflow presents *key features* of the planning phases, as well as those of each alternative paradigm in the respective rows[10]. From left to right, the workflow and the planning paradigms are divided in phases and framed in respective blocks.

The particularities between the two paradigms in the input and main phases are descriptive, hence as objective and representative as possible. The output phase contains qualification claims (e.g. standard, bespoke), intended to highlight the 'custom' nature of the Systems Planning℠ process.

[10] These parallel-running rows are also known as 'swim lanes'.

5 Discussion

5.1 Communicating instructions

Instructions — including the operational instructions of activities — are naturally 'prescriptive', although they could be considered in alternative *modes*, for various purposes — for instance, in an *evaluative* mode to judge their performance or suitability for a given purpose, or in a *predictive* mode for guessing the tactic of the opponent in chess (Table 1).

Mode	Meaning	Typical Use
Prescriptive	'how it should be'	instructions, suggestions
Descriptive	'how it is'	reports, indications, demonstrations
Predictive	'how it is likely to be'	forecasts, estimates
Evaluative	'how appropriate it is', 'how effective it is', etc.	assessments, apraisals

Table 1 Communication modes

The workflow of the first example (§ 4.1) is issued as an *indication* of how a particular artwork was produced, so the aggregated operational instructions are issued in a *descriptive* mode. The workflow of the second example (§ 4.2) is issued as a *suggestion* for how the workgroups should proceed, so the aggregated operational instructions are issued in a *prescriptive* mode — albeit in a 'soft' version. Finally, the workflow of the third example (§ 4.3) is issued as a *demonstration* of how the two alternative paradigms respond to the challenges of planning, so the aggregated operational instructions are issued in a *descriptive* mode.

5.2 Beyond the sequence

The 'process view', or sequential action–state perspective (§ 2), is not the only way to consider human activities (Table 2).

Perspective	Features	Examples
Process	logistics (action–state sequence, resources, etc.)	engineering projects, medical operations
Plan	(human) motives and related reasoning	business strategies, government policies
System	dynamics (e.g. structure, function, form)	reverse blueprints, causal loop diagrams

Table 2 Alternative and complementary perspectives of activity

A deeper view into the *motives* and *outcomes* of action — not in a computational 'input–output' fashion, but complemented by the *causal reasoning* of their relationships — can be captured in *plans* (Perdicoúlis, 2010, pp.77–130). However, not all plans are made this way, since popular understanding considers them as 'general instructions for action'. This popular perception of plans makes them similar to workflows, free of motives and causal relationships.

Finally, a remote view puts the activity in context: the 'system view' (Perdicoúlis, 2010, pp.42–44, 58–66). Knowledge of the system in which the activity takes place includes its form, structure, and function (Perdicoúlis, 2014b), and indicates points of intervention (Perdicoúlis, 2012d).

6 Conclusion

Aggregated operational instructions in the form of workflows create a 'true to life' overview of managed activities, which can be communicated succinctly in diagrams. This concise view permits a global understanding and memorable portrayal of the operation, as well as an appreciation of overall requirements (e.g. skills or preparation) and outcomes (e.g. benefits).

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