Appendix A
Redesign Heuristics

As part of the explanation of Heuristic Process Design in Chapter 8, a limited number of heuristics were discussed. In this appendix, the full list of 29 heuristics is presented that is part of this method. To further classify these heuristics, we will use the elements that were discussed to delineate business processes, i.e. customers, business process operation, business process behavior, organization, information, technology, and the external environment (see Section 8.1.2, page 300). Note that it is to some extent arbitrary how the heuristics are categorized, since some of these relate to more than one of these characteristics. At the end of this appendix, a table is shown that for each redesign heuristic indicates which of the performance dimensions of the Devil's Quadrangle it primarily targets.

A.1 Customer Heuristics

The three heuristics in this category focus on improving the interaction with customers:

Control relocation: "Move controls towards the customer". Different checks and reconciliation activities may be moved towards the customer. By moving billing controls towards the customer, for example, we may eliminate the bulk of billing errors and improve client satisfaction as a result.

Contact reduction: "Reduce the number of contacts with customers and third parties". The exchange of information with a customer or third party is always time-consuming, especially when it takes place by regular mail. Also, each contact may introduce errors. Imagine a situation where reconciliations are needed, like in the Ford example in Section 1.3.2 on page 11: Reducing the number of contacts in such a case may decrease cycle time and improve quality. Note that it is not always necessary to skip certain information exchanges, but that it is possible to combine them with limited extra cost.

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Integration: "Consider the integration with a business process of the customer or a supplier". This heuristic captures the idea of supply chain integration. The actual application of this heuristic may take on different forms. For example, when two parties jointly produce a product, it may be more efficient to perform several intermediate reviews than performing one large review after both parties have completed their parts. In general, integrated business processes should render a more efficient execution, from both a time and cost perspective.

A.2 Business Process Operation Heuristics

A business process operation view considers the implementation of a business process in terms of its activities. There are five heuristics with this focus:

Case types: "Determine whether activities are related to the same type of case and, if necessary, distinguish new business processes". One should be cautious of parts of business processes that are not specific for the business process they are part of. Ignoring this phenomenon may result in a less effective management of such a sub-process and a lower efficiency. Applying this heuristic may result in faster processing times and less cost.

Activity elimination: "Eliminate unnecessary activities from a business process". An activity is superfluous if it adds no value from a customer's point of view. Typically, control activities in a business process are unnecessary from this perspective; they are incorporated in the model to fix problems created (or not elevated) in earlier steps. The redundancy of an activity can also trigger activity elimination. The aims of this heuristic are to increase the speed of processing and to reduce the cost of handling an order.

Case-based work: "Remove batch-processing and periodic activities". Some examples of disturbances in handling a case are (a) that the case becomes piled up in a batch and (b) that the case is slowed down by periodic activities, e.g. because computer systems are only available at specific times. Getting rid of these constraints may significantly speed up individual cases.

Triage: "Split an activity into alternative versions". This heuristic suggests aligning the characteristics of cases with capabilities of resources to increase quality. An alternative is to subdivide activities into sub-categories. For example, a special cash desk may be set up for customers with an expected low processing time.

Activity composition: "Combine small activities into composite activities". Composing larger activities from smaller ones should result in the reduction of setup times, i.e., the time that is spent by a resource to become familiar with the specifics of a case.

A.3 Business Process Behavior Heuristics

A view on the behavior of a business process is concerned with ordering of activities. There are four heuristics within this category:

Resequencing: "Move activities to their appropriate place". In existing business processes, actual activity orderings often do not reveal the necessary dependencies between activities. Sometimes it is better to postpone an activity if it is not required for its immediate follow-up activities. The benefit would be that perhaps its execution may prove to become superfluous, which saves cost. Also, an activity may be moved into the proximity of a similar activity, in this way diminishing set-up times.

Parallelism: "Put activities in parallel". The effect of placing activities in parallel is that throughput time may be considerably reduced. The applicability of this heuristic in business process redesign is large. In practical settings, activities are often ordered sequentially without the existence of hard logical restrictions prescribing such an order.

Knock-out: "Order knock-outs in an increasing order of effort and in a decreasing order of termination probability". A typical element of a business process is the subsequent checking of various conditions that must be satisfied to deliver a positive end result. Any condition that is not met may lead to a termination of that part of the business process: the *knock-out*. If possible, the condition that has the most favorable ratio of (1) expected knock-out probability versus (2) the expected effort to check the condition should be pursued. Next, the second best condition, and so forth. This way of ordering checks yields on average the least costly business process execution.

Exception: "Design business processes for typical cases and isolate exceptional cases from the normal flow". Exceptions may seriously disturb normal operations. By isolating them, precious time may be saved and flexibility of the overall process is improved.

A.4 Organization Heuristics

The organization view refers to two categories of heuristics. The first set relates to the *structure* of the organization, specifically how resources are allocated. There are seven heuristics in this category:

Case assignment: "Let participants perform as many steps as possible". By using case assignment in the most extreme form, a participant will carry out all activities that belong to a particular case. The advantage of this heuristic is that this person will know the case well and will need less set-up time in carrying out subsequent activities. Also, quality of service may be increased.

Flexible assignment: "Keep generic participants free for as long as possible". Suppose that an activity can be executed by either of two available participants. Then, this heuristic suggests assigning it to the most specialized person. In this way, the likelihood of committing the free, more general participant to another work package is maximal. The advantage is that an organization stays flexible with respect to assigning work and that overall queueing time is reduced. Also, the workers with the highest degree of specialization can be expected to take on most of the work, which may result in a higher quality.

Centralization: "Let geographically dispersed participants act as if they are centralized". This heuristic exploits the benefits of a BPMS (see Chapter 9). After all, when a BPMS assigns work to process participants it becomes less relevant where they are located geographically. The specific advantage of this measure is that resources can be committed more flexibly, which yields a better cycle time.

Split responsibilities: "Avoid shared responsibilities for tasks by people from different functional units". The idea is that shared responsibilities are more likely to be a source of neglect and conflict. Reducing the overlap in responsibilities should lead to a better quality of activity execution. Also, a higher responsiveness to available work may be developed, so that customers are served quicker.

Customer teams: "Consider composing work teams of people from different departments that will take care of the complete handling of specific sorts of cases". The heuristic calls for creating dedicated teams that have the time and the commitment to take on particular work. It provides benefits in terms of time and quality. In addition, working as a team may improve the attractiveness of the work, which is another quality aspect.

Numerical involvement: "Minimize the number of departments, groups and persons involved in a business process". This will lead to less coordination problems, which makes more time available for the processing of cases. Reducing the number of departments may also split responsibilities, which has a positive impact on quality.

Case manager: "Appoint one person to be responsible for the handling of each type of case". The person, called *case manager*, is responsible for a specific order or customer. The difference with case assignment is that the emphasis is on management of the process—not its execution. The most important aim is to improve upon the external quality. The business process will become more transparent from the viewpoint of a customer: the case manager provides a single point of contact. This, in general, positively influences customer satisfaction. It may also have a positive effect on the internal quality of the business process, as someone is accountable for and committed to correcting mistakes.

The second set relates to the organizational population and the resources being involved in terms of their type and number. This category includes three heuristics:

Extra resources "If capacity is insufficient, increase the available number of resources". This heuristic aims at extending capacity to reduce queue time. It may also help to implement a more flexible assignment policy.

Specialize "Consider deepening the skills of participants". Participants in a process may be turned into specialists. They may work quicker and deliver higher quality than less specialized resources due to their experience.

Empower "Give workers decision-making authority instead of relying on middle management". In traditional business processes, substantial time may be spent on authorizing the outcomes of activities that have been performed by others. If workers are empowered to take decisions autonomously, this may result in smoother operations with lower throughput times. The reduction of middle management from the business process also reduces labor cost.

A.5 Information Heuristics

The information category describes redesign heuristics related to the information that is being processed within the business process. It covers two heuristics:

Control addition: "Check the completeness and correctness of incoming materials and check the output before it is sent to customers". This heuristic promotes the addition of controls to a business process in order to increase quality.

Buffering: "Instead of requesting information from an external source, buffer it and subscribe to updates". Obtaining information from other parties is time-consuming. By having information directly available when required, throughput times may be substantially reduced. This heuristic can be compared to the caching principle that microprocessors apply.

A.6 Technology Heuristics

This category describes redesign heuristics related to the technology the business process utilizes. It includes activity automation and integral technology.

Activity automation: "Consider automating activities". Automation improves processing time and provides more predictable results at lower cost. Instead of fully automating an activity, it may also be considered to provide automated support to process participants.

Integral technology: "Elevate physical constraints in a business process by applying new technology". In general, new technology can offer all kinds of positive effects across an entire business process. For example, a BPMS may support the coordination of all its activities; a Document Management System, in its turn, will open up to all participants the same information available on cases. The major effect would be a better quality of service.

A.7 External Environment Heuristics

The external environment category contains heuristics that try to improve upon the collaboration and communication with third parties. There are three heuristics in this category:

Trusted party: "Use the insights of a trusted party". Some decisions are generic and standardized to the extent that other parties will get the same result for the same input data. An example is the creditworthiness of a customer that bank A wants to establish. If a customer can present a recent creditworthiness certificate of bank B, then bank A may be likely to accept it. Relying on a trusted party reduces cost and may cut processing time.

Outsourcing: "Consider outsourcing a business process completely or parts of it". Another party may be more efficient in performing the same work, so it might as well perform it for the business process that is up for redesign. The obvious aim of outsourcing work is that it will generate less cost.

Interfacing: "Consider a standardized interface with customers and partners". A standardized interface diminishes the occurrence of mistakes, incomplete applications, or unintelligible information exchanges. This may yield better quality due to less errors and faster processing time.

The various heuristics are listed in Table A.1, which shows the main performance dimensions of the Devil's Quadrangle that are explicitly being targeted by each (+).

Table A.1 Performance dimensions for the redesign heuristics

	Time	Cost	Quality	Flexibility
Activity automation	+	+	+	·
Activity composition	+	·	·	·
Activity elimination	+	+	·	·
Buffering	+	·	·	·
Case assignment	+	·	+	·
Case manager	·	·	+	·
Case types	+	+	·	·
Case-based work	+	·	·	·
Centralization	+	·	·	+
Control addition	·	·	+	·
Control relocation	·	·	+	·
Contact reduction	+	·	+	·
Customer teams	+	·	+	·
Empower	+	+	·	+
Exception	+	·	·	+
Extra resources	+	·	·	+
Flexible assignment	+	·	+	+
Integral technology	·	·	+	·
Integration	+	+	·	·
Interfacing	+	·	+	·
Knock-out	·	+	·	·
Numerical involvement	+	·	+	·
Outsourcing	·	+	·	·
Parallelism	+	·	·	·
Resequencing	+	+	·	·
Specialize	+	·	+	·
Split responsibilities	+	·	+	·
Triage	·	·	+	·
Trusted party	+	+	·	·

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