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Researching Operations Management – Routledge 2009 book

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Key messages

Research is about developing, producing and also disseminating new knowledge. When doing research a paramount issue will then be the contribution of new knowledge to already existing knowledge. It is then important that the new knowledge can be trusted as valid and reliable. For that reason the researcher will use methods that can make it probable that the receiver of the knowledge can trust the propositions generated by the research.

There are different kinds of research and different methods that can be used in different research. The methods are more or less feasible depending on the type of research and they often create different kinds of knowledge.

The choice of method is not necessary a singular decision. On the contrary combinations of methods are likely to enhance the value of the contribution when applied to different parts of the research. Often a researcher or research institute will focus not only on certain issues but may also specialize in certain types of studies and research methods.

When it comes to carrying through the research careful planning and rigorous execution is important. Everything from literature mapping to structured analysis and synthesis must be of high standard and understandable for the receiver.

However good the methods are, there are still the issues of relevance and ethics. The research should be of value for important stakeholders. Simultaneously the research output should not create any damage to man or environment.
It will not be possible to, with total conviction, claim that a certain piece of research is good. But the scientific community has well-established processes for assessing research although bad pieces may get through and too innovative ideas may be hampered.

Summary of learning from the chapters – a brief overview

The book is both a textbook and a handbook. In chapter two Operations is described and characterized as transformation of resources by transforming resources into information, products and services. Operations exist throughout other function outside the operations function itself. There are several research approaches which have a managerial focus. The book has an inclination to a European research tradition. Good research is discussed based on contribution to knowledge and rigor in process. The generally thought of most significant characteristic of good research is that, methodologically, it is well done. Research is expected to provide trustworthy knowledge since it is done by independent knowledgeable scholars trained to develop knowledge using rigorous processes. A challenge for the OM researcher is to create contributions and value for both academia and practice. This challenge will promote the often empirically-based research approaches used in OM. How to think of the research contribution is analyzed. Due to a cumulative character of knowledge and sequential development, different research outputs in different phases of the development of the field of knowledge will be seen. The fit between problem, method and contribution is often reached in an iterative manner. A holistic view from discussing the issues and mapping the existing knowledge via research design and structured analysis to putting the contribution in relation to knowledge is emphasized. Demands on research involve newness in contribution, research rigor and generalizability but also relevance and ethical considerations. Eventually we focus the presentation of the research and specifically characteristics of scientific publication. In the academic world the old saying “Publish or perish” is increasingly relevant in global competition. If you do not publish you do not exist!
Understanding criteria for reviews are important before planning the manuscript. The readers, and before that the reviewers, will ask questions such as what is the purpose of the research, what is the contribution and what does the author claim, how well is the claim supported, what is the

theoretical framework and does the author know the area well enough, is the method adequate, is the report well structured and easy to follow, and is it well written? The chapter concludes with a checklist for analyzing manuscripts.

In chapter three we learn that designing research in operations management needs to take into account the ‘messy’, iterative nature of a typical management research project. In the process of research the researcher will discover issues, theories, literature sources, phenomena, characteristics and variables that will not have been considered at the outset. What can be done is to manage the process by ‘asking the right questions’. This is essentially what research design is all about and good research design will recognize that the research will be likely to evolve. Clear concrete steps to ensure that the process is a rigorous and reliable one can be taken. The chapter addresses these steps by concentrating on how to position the research. A key issue is to know the existing literature since research is supposed to take knowledge a step ahead from that. It is also important to have an overview of a range of research methods, to avoid being constrained by one approach or methodology. Often combinations of methods (and methodologies) are valuable. Further, the ‘personality’ of the researcher plays a role; there are different types of researchers and one should feel comfortable with what is done and how it is done. Finally, quality is paramount in research and it is vital to have a clear knowledge of what good research looks like and ensure steps that are taken to assure a valid and rigorous process is followed.

Chapter four teaches us surveys but also many basics about planning and conducting research. Before we get started we need to make clear the unit of analysis, construct definitions, and hypotheses or research aim. What is it we are going to study, what is the population, the sample and the subjects? Instruments to use for measuring constructs should be developed. This activity implies to move from the theoretical to the empirical domain. It is considered so important in OM that it deserves ad hoc research projects and publications. A lot of care must be taken in selecting the observable aspects to ask for, in choosing the appropriate wording, in assessing whether the questions can be trustily answered, in identifying individuals who are informed and can answer, and in getting data that refers to the unit of analysis level and not to different levels. Getting data from different sources enables triangulation which enhances data validity. Then there are questions about if satisfactory data has been received. There may be biases and systematic lack of

data influencing if data is representative. There are a range of quality aspects to consider. Reliability indicates dependability, stability, predictability, consistency, accuracy and refers to the extent to which a measuring procedure yields the same results on repeated trials. Construct validity refers to the degree to which a measure represents and acts as the concept being measured. Criterion-related validity is established when the measure differentiates subjects on a criterion it is expected to predict. That takes us to the testing. In order to acquire knowledge of the characteristics and properties of the collected data, some preliminary data analyses are usually conducted before performing measurement quality assessment or tests of hypotheses. Significance tests can be grouped into two general classes: parametric and non-parametric. Parametric tests are generally considered more powerful because their data are typically derived from interval and ratio measurements with likelihood model (i.e. the distribution) known, except for some parameters. Non-parametric tests are also used, usually with nominal and ordinal data. Finally results are interpreted. When interpreting results, the researcher moves from the empirical to the theoretical domain. This process implies considerations of inference and generalisation.

Chapter five set out a step-by-step approach for conducting case research. The case method allows the questions of *why*, *what* and *how*, to be answered with a relatively full understanding of the nature and complexity of the complete phenomenon; and the case method lends itself to early, exploratory investigations. But case studies can be used for different types of research purposes such as exploration, theory building, theory testing, and theory extension/refinement. There are several considerations regarding case selection, first the number of cases. The fewer the case studies, the greater the opportunity for depth of observation. But single cases have limitations. The first is the limits to the generalizability of the conclusions, models or theory developed from one case study. A second choice in case selection is whether to use retrospective or current cases. Longitudinal case research can be particularly valuable. If multiple case studies are to be used for research, then a vital question is the case selection or sampling. When building theory from case studies, case selection using replication logic rather than sampling logic should be used. Each case should be selected so that it either predicts similar results (a literal replication), or produces contrary results but for predictable reasons (a theoretical replication). Typically the prime source of data in case research is structured interviews, often backed up by unstructured interviews and interactions. Other sources of data can include personal observation, informal conversations,

attendance at meetings and events, surveys administered within the organisation, collection of objective data and review of archival sources. The reliability and validity of case research data will be enhanced by a well-designed research protocol. In designing case research a key question is what should be the number of respondents? May be a set of questions can be reliably answered by one “key informant’. Otherwise the researcher may consider interviewing multiple respondents, or using a follow up survey with multiple respondents. An underlying principle in collection of data in case research is that of triangulation, the use and combination of different methods to study the same phenomenon. Much, but not all field data will be collected through interviews. Interviews can be unstructured, focused with more structure or highly structured resembling a questionnaire. Alternatively evidence can also be gathered by direct observation of meetings, processes etc. Whatever method is used to transcribe data, it is important there are good and accurate records and minutes of research interviews and meetings. Once data are collected they should be documented and coded. Documentation can include typing up of notes and/or transcription of tapes. This produces a *case narrative*. Central to effective case research is the coding of the observations and data collected in the field. It is important to try to reduce data into *categories.* Having developed detailed case descriptions and coded the data, the first step is to analyse the pattern of data within cases. A very useful and common starting point is to construct an array or display of the data. The systematic search for cross-case patterns is a key step in case research. It is also essential for enhancing the generalizability of conclusions drawn from cases. In an iterative process emergent themes, frameworks or hypotheses are compared with data from each case. This will iterate towards theory that provides a close fit. When the data seem to support hypotheses, case research allows the researcher to go one step further and examine the underlying reasons in each case as to why things are happening. What are the theoretical reasons for the observed relationships?

Chapter six deals with longitudinal field studies, which are in-depth studies of change processes inside organisations. Longitudinal field studies are case studies but are distinguished by studying a phenomenon over time, in real-time. They are particularly suitable for research questions concerning how organizational change emerge, develop, grow or terminate over time. To gain access to organizations to conduct a longitudinal field study, it can be set up as clinical research, where the researcher participates in and studies organizational change. Before entering the field, a

framework for data gathering is critical. In addition to the case study researcher's toolbox of methods for data collection, the longitudinal field researcher relies heavily on participant observation. Participant observation requires careful and meticulous note taking, together with a system to organize the collected data. Analysing longitudinal field data is a challenging task due to the often huge amounts of data being collected and the lack of well-defined methods for data analysis. The analysis requires identifying sequences and patterns in the events, using for instance graphical techniques. To increase the reliability and validity, the researcher needs to adhere to a systematic research, coding and analysis process. Generalization in longitudinal field studies is always towards theory, not samples, since they tend to rely heavily on a few cases. In the process of generalizing from longitudinal field studies, previous literature is absolutely critical.

In chapter seven we learn that action researchers actually take action. It can be the researcher working with the operations manager but also the operations manager can be a researcher. Action research deals with actual problematic situations simultaneously solving problems and developing new knowledge. Doing this the research is conducted in real time with a focus on change and organizational development and there is a lot of interaction between the researcher and the organization. Doing action research puts some specific demands on the researcher who should be well-positioned in academia and well-regarded in practice. Preparations including gaining access and developing relations with the organization to be accepted are crucial. The action research process typically goes on in repeated cycles of observation, planning, action, and evaluation. The results are typically situation-specific and incremental. Generalization may not be the key characteristic but the strength of the results lies in the deep understanding, the relevance of real problems, and the construction of workable solutions that have been tested.

Chapter eight deals with the use of modelling and simulation for researching Operations Management issues. The quantitative modelling process that underlies the modelling and simulation research approach is characterized. Inventory control, forecasting, mathematical optimization and queuing theory are mentioned as examples of influential results produced by modelling and simulation research. Modelling and simulation as descriptive or prescriptive axiomatic research are discussed and guidelines on how to conduct qualitative model-based

research, both for analytical research and for simulation research are given. Finally guidelines for doing model-based empirical research are given.

Choosing and combining approaches – triangulation in methods

A key point in the book is that a combination of methods is a strength in creating a solid research contribution. There are different types of mixes. Hence the methods can be mixed meaning that for example quantitative and qualitative methods are used in combinations. But there can also be a methodology perspective in which mixed methods are used as a method in itself for example combining different types of research questions or methods. A third perspective is paradigmatic perspective in which different world views are combined. A fourth perspective would be a practice perspective in which research procedures are combined.

Generalization into different management areas – beyond OM

The book is primarily aimed at the field of Operations Management. The field contains many subfields and adjacent fields such as Supply chain management, Technology management, Product development, etc. However the book also aims at guiding research in other areas with similar issues, empirical bases and contexts. There are some characteristics of research fields for which we believe the discussions are particularly relevant. Resources that are gathered, structured, processed, controlled, and so on can be human, technical or information and they may appear in organizational units dealing with marketing, manufacturing, after sales service, financial control or whatever. We claim that most of the research methods dealt with in the book apply to most of what goes on in organizations because most activities in most organizations are operations.

Common characteristics or commonalities lie in that we deal with managerial issues of human, technical or information resources that are gathered, structured, processed, and controlled. The managerial issues may concern strategy, resources generation, organization, systems design, distribution or whatever. Generalizability of the methods described lie in the characteristics of operations and the perspectives of managing them. It is not the functional area that defines the focus.

Summary

- Key messages from the book
  The role of research is to develop new knowledge and hence contribute by adding to existing knowledge. Demands on research concern both being relevant and trustworthy. Therefore clearly described good methods are important. The research must not only be relevant but also ethical.
- Choosing and combining approaches – triangulation in methods
  Mixtures of methods, methodologies, and even paradigms may add to the value of research. The validity issue then becomes both more nuanced and complex.
- Implementing good practices
  Best practice is not an absolute concept but well established research publications are an important source and especially publications with high impact. Demonstrating knowledge, contribution and rigor in carrying through is important. Critical analysis in relevant research communities is a key activity.
- Generalization into different management areas – beyond OM
  Operations exist across functions. What is characteristic for research methods in the book come from characteristics of operations and management. The conditions for generalization of the applicability are a consequence thereof.
- A contract with science – a researcher ethic
  Research should be considered in its ethical context. There are many stakeholders in mankind, society and environment. A formal contract is often not only good but requested.

Reference (the text is an extract from the book)

Karlsson, C. (ed), et al . (2009). *Researching Operations Management*. New York, USA and London, UK, Routledge.