**Chapter 1**

**The IS and Computing Disciplines**

The text delineates the disciplines of Information Systems (IS) and Computing, highlighting IS's focus on developing and using information systems within social and organizational contexts, often involving computers, while Computing encompasses computer science, software engineering, and related fields emphasizing technological aspects. Despite being distinct disciplines, they share overlaps in analyzing, developing, and using computer-based products, prompting their joint consideration in this book. It addresses the lack of literature on research methods specific to IS and computing, focusing on research questions, approaches, and examples within these disciplines.

**Evidence-based Practice**

The text delineates the evolution of research practices in Information Systems (IS) and Computing, highlighting a shift towards empirical research aimed at understanding real-world implementation and effectiveness of computer-based products and development methods. It emphasizes the importance of evidence-based practice, wherein research findings serve as evidence to support effective information system development and computing methodologies. Furthermore, it underscores the need for rigorous empirical assessment and evaluation to validate theories and proposals in the field, bridging the gap between academic theory and practical implementation. The text suggests that this book aims to assist researchers in conducting studies that generate evidence to support their work and evaluate evidence presented by others in the field.

**The Internet and Research**

The text highlights the growing significance of the Internet and World Wide Web in modern research, particularly for IS and computing researchers, offering potential research topics, methods like Internet-based surveys and interviews, distinctions in Internet-based research, and examples of previous studies utilizing the Internet or web to support research processes.

**What is Research?**

The text defines research as the process of creating new knowledge to address a problem or question, using appropriate methods and satisfying the needs of the users of that research. It illustrates research using an everyday example of dealing with a punctured tire, emphasizing the importance of gathering, analyzing, and interpreting data to draw well-founded conclusions. It also highlights the distinction between everyday thinking and good academic research, noting that academic research must adhere to certain standards and be presented effectively to satisfy its users, who may be members of the academic community. Additionally, it discusses the diverse philosophies of research within IS and computing, emphasizing the importance of understanding these different approaches in conducting research in these disciplines.

**Let’s Have an Argument**

The text explains that in the context of research, a thesis has two meanings: it refers to both the written report itself and the argument presented within it. Researchers are tasked with assembling and defending an argument to demonstrate the creation of new knowledge. This involves employing logic, referencing existing literature, and conducting fieldwork to gather and interpret data. The book aims to assist researchers in constructing and supporting their arguments effectively to satisfy academic standards.

**Evaluating Research**

The text explains that the book provides "Evaluation Guides" to help readers analyze and assess the work of other researchers. These guides enable individuals to determine if the research meets the academic standards of their discipline and if enough evidence supports the claims made. Evaluating others' research is important because it ensures the credibility of cited sources, aids in refining one's own research through identifying flaws, and empowers individuals to critically assess reported research findings rather than blindly accepting them.

**‘I Just Want to Develop a Computer-based System’**

The text explains that developing computer-based systems is a form of research because it involves gathering, analyzing, and presenting data to answer specific questions about the feasibility or effectiveness of the product. Even seemingly straightforward tasks contribute to research if they introduce something new or innovative. Additionally, researchers are encouraged to evaluate their products in real-world settings, adding another layer of research inquiry to the process. Overall, the message is that system development inherently entails research activities and should be approached with this perspective.

**Rigor and Relevance in Research**

The text discusses the importance of rigor and relevance in IS and computing research. Rigor entails systematic conduct and validity, ensuring logical connections between research tasks and the reliability of findings. Relevance refers to the pertinence of research findings, often assumed to be significant for practitioners, but not clearly defined in the context of IS and computing.

Practitioners encompass various individuals involved in using or developing computer-based products, including those in business, education, and community work. However, the potential users of research also include academics and students. Academics engage with research for its intellectual value, while students can learn from published research papers to develop their own research questions and methodologies.

Ultimately, research in IS and computing should aim to be both rigorous and relevant, addressing significant questions in the field and engaging with diverse audiences effectively.

**The 6Ps of Research**

The 6Ps of research encompass the following aspects, all crucial for any research project:

1. **Purpose**: Identifying the reason for conducting research, including the research topic, its significance, specific research questions, and objectives.
2. **Products**: Outcomes of the research, which can include answers to research questions, unexpected findings, contributions to knowledge, and tangible outputs like a thesis, dissertation, or conference paper.
3. **Process**: The sequence of activities undertaken in the research project, involving conceptual framework establishment, research strategy selection, data generation methods, data analysis, and conclusion drawing, conducted systematically for rigor.
4. **Participants**: Direct and indirect individuals involved in the research, including those interviewed or observed, editors, and the researcher themselves, emphasizing ethical treatment and legal considerations.
5. **Paradigm**: Underlying philosophical perspectives guiding the research, including different views such as positivism, interpretivism, and critical research, influencing the research questions and methodologies.
6. **Presentation**: The dissemination and explanation of research to others, whether through written papers, theses, conference presentations, or product demonstrations, emphasizing professionalism in delivery.

In summary, the 6Ps of research are Purpose, Products, Process, Participants, Paradigm, and Presentation.

**Structure of the Book**

This book is organized around the 6Ps framework of research: Purpose, Products, Process, Participants, Paradigm, and Presentation.

* **Chapter 2** addresses the purpose of research and potential outcomes.
* **Chapter 3** provides an overview of the research process, while Chapter 4 focuses on Internet research.
* **Chapter 5** delves into participants and ethical considerations in research.
* **Chapters 6-18** detail the research process, covering topics such as literature review, research strategies (surveys, experiments, case studies, etc.), data generation methods (interviews, observation, questionnaires, etc.), and data analysis techniques (quantitative and qualitative).
* **Chapters 19 and 20** explore philosophical paradigms in research.
* **Chapter 21** discusses writing up research and presentation methods.

Each chapter includes practical exercises for reflection and skill development, along with suggestions for further reading to explore the concepts in greater depth and examples of research in IS and computing.

**Chapter 2 – The Purpose and Products of Research**

**Reasons for Doing Research**

People engage in research for various reasons beyond mere obligation. While some may be compelled to conduct research due to academic requirements or contractual obligations, intrinsic motivations often play a significant role. Understanding these motivations can help individuals select research topics that genuinely interest them and maintain their enthusiasm throughout the process.

**To add to the to the body of knowledge**

Some researchers are driven by the desire to contribute to the body of knowledge within their specialized field, even if the newfound knowledge lacks immediate practical application. For instance, studying historical patterns of Sunday School attendance may not have direct implications for current educational policies or technological advancements. However, the innate human curiosity to explore and uncover new insights motivates these researchers. While adding to the body of knowledge is a fundamental expectation for PhD students and undergraduate researchers, it is often accompanied by additional motivations.

**To solve a problem**

Many researchers in the fields of Information Systems (IS) and computing are motivated by the desire to solve a specific problem. This problem-solving approach often involves developing computer-based products or solutions to address challenges or fulfill needs. For instance, researchers may seek to create websites based on the latest marketing theories, design tools to support online discussions in educational settings, or render realistic textures in virtual environments. While some projects may stem from personal technical challenges, researchers are typically expected to demonstrate how their work could benefit others. For example, Linus Torvalds initially aimed to build a terminal emulation system for personal use but eventually created the Linux operating system, which has widespread global usage.

**To find out what happens**

In the realm of Information Systems (IS) research, a significant area of interest lies in understanding what happens when new computer systems are implemented and used in real-world settings. Researchers seek answers to questions like whether the introduction of email systems leads to the abandonment of traditional mail, or if certain users ignore new technologies. This inquiry into real-world outcomes is crucial for understanding the interaction between technical systems and social dynamics. Furthermore, there is a growing emphasis on empirically assessing software systems and development processes to evaluate their effectiveness and real-world impact. This includes evaluating whether proposed development approaches, such as structured methods or Unified Modeling Language (UML), deliver the promised benefits in practice.

**To find the evidence to inform practice**

In the field of IS research, there is a quest to gather evidence that can guide practice in developing computer systems and adopting new methodologies or tools. Researchers seek to address questions about the effectiveness of various development methods and tools, such as structured methods, agile approaches, and formal methods. They aim to provide empirical evidence to inform decisions about which approaches, or tools are most suitable for different circumstances. Moreover, IS research endeavors to offer insights into the adoption of software applications by businesses, helping managers understand the factors that facilitate or hinder successful implementation. Ultimately, the goal is to equip practitioners with evidence-based guidance to make informed decisions about adopting new ideas and technologies in system development and management practices.

**To develop a greater understanding of people and their world**

Research in the field of IS and computing also aims to develop a deeper understanding of people and their interactions with technology. This curiosity-driven exploration can lead to practical applications, such as informing the design of software for home PCs. Researchers may investigate questions like whether home users prefer a computer interface resembling a television or one reflecting aspects of their home life. Similarly, they might explore the effectiveness of different types of website advertising for home-based web surfers or the impact of internet shopping on family dynamics. By delving into these areas, researchers seek to challenge stereotypes and provide valuable insights that can inform the design of technology and online experiences to better meet the needs and preferences of users.

**To predict a plan and control**

Research in the field of IS and computing also focuses on predicting, planning, and controlling various phenomena using computer-based systems. For instance, researchers work on predicting global warming effects and weather patterns by gathering data and building simulation models. Similarly, organizations and policymakers conduct research to forecast the future demand for technology to plan manufacturing and IT infrastructure provision. Computer-based information systems aid in planning and controlling operations within organizations, such as managing cash flow or handling admissions in universities. Researchers in this domain may explore the development of systems for prediction, planning, and control, as well as their practical applications and effectiveness.

**To contribute to another people’s well-being**

Research in the field of IS and computing also aims to contribute to the well-being of individuals. For instance, researchers explore ways to design better user interfaces to assist older or disabled individuals in using computers more comfortably. Additionally, they may develop computer systems aimed at easing specific challenges individuals face, such as helping those with arachnophobia overcome their fear through virtual reality simulations.

**To contribute to personal needs**

Some individuals engage in research, particularly pursuing a PhD, as a personal challenge to test their abilities and see if they can meet the demands. Others undertake research with the belief that it will benefit their future careers. Additionally, for some women, obtaining a doctoral degree provides a resolution to the title issue (Mrs/Miss/Ms).

**To test or disprove a theory**

In IS and computing, testing and disproving theories is a fundamental aspect of scientific research. Various theories exist, such as the potential harmful effects of computer games on children's development due to violence and sedentary behavior, versus arguments suggesting benefits for perception, motor skills, and reaction times. Research aims to test these theories to determine their validity and implications.

**To understand another person’s point of view**

Researchers may immerse themselves in a group to understand their perspectives and perceptions, whether the group is aware of the research or not. For instance, working on an IT help-desk provides insights into how colleagues perceive end-users who seek assistance, whether as valued customers or adversaries.

**To create mote interests in the researcher**

Some researchers are motivated by the prospect of gaining recognition and visibility, such as through keynote speeches or media appearances, which enhances their reputation. However, for novice researchers, achieving immediate fame is improbable. Nevertheless, various motivations drive individuals to conduct research, and while these motivations may differ, they all ultimately contribute to the generation of new knowledge.

**Possible Products – the Outcomes of Research**

**New or Improved Product**

Research in information systems (IS) and computing often aims to develop novel or enhanced products. This category encompasses various outcomes, from the creation of computer applications meeting specific functional requirements to the production of digital art in multimedia departments. Additionally, innovative methods for developing computer applications may constitute a significant product of the research endeavor.

**New Theory**

The realm of computing continually evolves, necessitating the formulation of new theoretical frameworks to guide its understanding and application. Given the dynamic nature of computer technology and its interaction with individuals and societies, there exists ample scope for the development of novel theories. These theories delve into issues of efficient and effective utilization of computing resources and shed light on the evolving dynamics between technology and its users.

**Re-interpretation of an Existing Theory**

In the field of IS and computing research, scholars often explore the adaptation and application of existing theories to novel contexts. This approach involves reinterpreting theories from domains such as psychology, economics, or education and examining their relevance within the context of IS and computing. Researchers seek to elucidate how these theories can be integrated into new design paradigms or operational frameworks, thereby enriching the understanding of technological phenomena.

**New or Improved Research Tool or Technique**

In the realm of information systems (IS) research, there's a growing interest in adopting newer research tools and techniques borrowed from the social sciences. While conventional methods like surveys and experiments remain predominant, newer approaches such as action research and qualitative data analysis are gaining traction. There's a notable gap in the adoption of these approaches within computing research, presenting an opportunity for IS and computing researchers to explore their efficacy and applicability.

**New or Improved Model or Perspective**

Research outcomes often involve proposing novel models or perspectives to examine phenomena in a fresh light. For instance, seminal works by Chen and Morgan introduced innovative perspectives in database design and organizational analysis, respectively, encouraging scholars to view entities and organizations from alternative conceptual frameworks.

**In-depth Study of a Particular Situation**

Given the evolving nature of computer technology and its diverse applications, there's ample scope for conducting in-depth studies within previously unexplored contexts. Examples include scrutinizing a systems development department's transition to a new methodology or investigating the evolution and outcomes of a company's website, alongside its alignment with existing theoretical frameworks.

**Exploration of a Topic, Area, or Field**

Research often entails comprehensive explorations of specific topics or domains, typically manifesting in literature-based surveys to assess the current state of knowledge. These surveys extend beyond mere description, aiming to contribute by organizing, analyzing, and synthesizing existing literature, thereby identifying gaps, controversies, or areas necessitating further investigation.

**Critical Analysis**

Critical analyses form a crucial aspect of research outcomes, involving rigorous examinations and evaluations of various phenomena. Examples include scrutinizing the features and implications of systems development methodologies or evaluating government policies concerning IT infrastructure development. Comparative analyses, such as examining the efficacy of different local governments' websites during crises, further enrich our understanding through juxtaposition and evaluation.

**Unanticipated outcomes**

The text discusses the potential for unexpected outcomes in research projects. It gives examples where studies led to unforeseen discoveries alongside intended results. For instance, an ethnographic study on IT use in a business revealed insights into research strategies. Similarly, a software project for tutors uncovered insights into user interface design during evaluation. Emphasizing the importance of acknowledging and exploring such surprises, the text also highlights the significance of disseminating research findings through academic channels like theses or journal articles.

**Finding and Choosing Research Topics**

**Introduction**

The text explores methods for finding and selecting research topics, acknowledging the diverse sources and approaches researchers may utilize.

**Sources of Research Ideas**

Various channels serve as sources for research ideas, including suggestions from departmental staff, past research student work, recent academic papers, current events, expressed needs from potential clients, calls for conference papers or journal issues, and challenging assumptions lacking evidence.

**Brainstorming and Clustering**

Collaborative brainstorming techniques, such as clustering and group discussions, can facilitate idea generation by encouraging participants to contribute keywords, concepts, and suggestions freely. Ideas are then examined and grouped to identify potential research topics that align with the researcher's interests and motivations.

**Summary**

The process of finding and selecting research topics involves exploring diverse sources of inspiration, from academic literature to current events and personal interests, and employing collaborative brainstorming techniques to generate and refine ideas.

**Selecting a topic**

Selecting a topic involves considering two main criteria: enjoyability and feasibility. It's crucial to choose a topic that interests you, as lack of interest can hinder the research process. Express potential topics as research questions and break them down into objectives to assess feasibility. Consider the following questions to gauge feasibility:

* **Novelty and Value:** Determine if the research will offer new insights or address gaps in existing knowledge.
* **Symmetry of Potential Outcomes:** Ensure that the research will yield valuable results regardless of the findings.
* **Contribution to Knowledge:** Assess whether the research will contribute to knowledge even if technical outcomes are incomplete.
* **Availability of Theory:** Consider if existing theories can guide the research process.
* **Scope and Timeframe:** Determine if the research aligns with the expected scope and time constraints.
* **Personal Motivations and Skills:** Ensure the topic aligns with your interests, strengths, weaknesses, and learning objectives.
* **Availability of Resources:** Assess if you have access to the necessary resources, such as hardware, software, and funding.
* **Objectivity and Bias:** Ensure you can approach the topic objectively without preconceived notions.
* **Safety and Ethics:** Verify that the research can be conducted safely and ethically without causing harm or discomfort to yourself or others.

Finally, seek guidance from supervisors to refine ideas, assess feasibility, and ensure alignment with course requirements. Remember, selecting a research topic is an iterative process, and it's normal to feel uncertain initially. Utilize available resources and seek support to make an informed decision.

**I Write Therefore Think**

Initiating the process of documenting research ideas and associated objectives as soon as they arise is imperative. It is advised to jot down thoughts regarding the feasibility and enjoyment of pursuing each objective to determine the viability of the research topic. Writing down these considerations aids in clarifying ideas and making informed decisions about research direction. The act of writing not only serves as record-keeping but also facilitates the clarification of thoughts, helping researchers uncover their true perspectives. Additionally, maintaining a written record of thoughts, problems, insights, plans, and emerging analyses throughout the research project is beneficial. This practice enables researchers to:

**Enhance Communication with Supervisors:** Documenting thoughts allows for clearer communication with supervisors compared to verbal expression, aiding in better understanding.

**Facilitate Inclusion in Formal Documents:** Written documentation can be included in project proposals, dissertations, or theses, providing a structured basis for further research.

**Improve Final Report Writing:** Regularly writing up ideas, rationales, and arguments develops strong report writing skills, easing the process of producing the final report, dissertation, or thesis.

**Evaluating Research Purpose and Products**

A critical examination of research papers is essential to assess their purpose and the quality of their products. Even if the underlying theory, research approach, or findings are not fully comprehensible, researchers can still evaluate the research's purpose and the effectiveness of its communication. Utilizing an "Evaluation Guide" can assist researchers in assessing research papers effectively.

**Chapter 3 – Overview of the Research Process**

**Introduction**

This chapter introduces the research process, which is one of the key components of research alongside the purpose and products. It outlines the sequence of activities required to address a research question and present evidence and conclusions to an academic audience. Simply finding an answer to a research question is insufficient; researchers must subject their findings and process to scrutiny by other academics to contribute new knowledge to the field of IS or computing.

**Personal experiences and motivation**

Researchers embark on their research journeys for various reasons, shaped by their personal experiences, preferences, strengths, and weaknesses. Reflecting on these factors helps in identifying potential research questions and staying motivated throughout the research process.

**Literature review**

Conducting a thorough literature review is a fundamental step in research, involving the review of existing literature, including books, journal articles, conference papers, and related computer artifacts. This process helps researchers understand what has been previously explored in their field, identify gaps in knowledge, and formulate a research question that contributes to existing scholarship. Additionally, researchers must critically evaluate previous work, identify common themes, and synthesize the literature into a coherent framework that justifies their own research.

**Conceptual framework**

The literature review lays the groundwork for developing a conceptual framework, which provides the theoretical foundation for the research. It helps researchers define the scope of their study, identify key concepts, and establish the theoretical underpinnings guiding their investigation. The conceptual framework serves as a roadmap for designing research strategies and methods, guiding data collection and analysis, and ultimately shaping the outcomes of the research.

**Literature review**

The literature review is a fundamental aspect of academic research, involving a comprehensive examination of existing literature in the chosen field. It encompasses various sources such as books, journal articles, conference papers, and relevant digital artifacts. By reviewing the literature, researchers can identify previous research efforts, understand what has already been explored, and pinpoint areas that require further investigation. Moreover, critical evaluation of prior work and identification of common themes play a crucial role in shaping the direction of the research. The literature review serves to provide a solid foundation for the research by informing the development of research questions and establishing a conceptual framework.

**Research question**

Formulating a clear research question or set of questions is essential for initiating the research process. These questions often arise from personal motivations, interests, and desired knowledge outcomes, as well as from insights gleaned from existing literature. Researchers may also draw inspiration from suggestions in academic literature or calls for research on specific topics. A well-defined research question guides the entire research endeavor and serves as a focal point for investigation.

**Conceptual framework**

The conceptual framework of a research project serves to structure the researcher's approach to the topic and the overall research process. It elucidates various aspects, including the factors constituting the research topic, the researcher's perspective (whether theoretical or technological), the chosen research methodology, data analysis techniques, strategies for designing and creating IT products, and criteria for evaluating the research outcomes. This framework is typically informed by the findings of the literature review, with many components derived from and justified by previous research efforts. It provides a roadmap for conducting the research and ensures coherence and consistency throughout the project.

**Strategies**

Strategies in research refer to the overarching approaches taken to answer research questions. This book outlines six key strategies commonly employed in academic research:

1. **Survey**: This strategy involves gathering data from a large group of individuals or events in a systematic manner. The collected data is then analyzed to identify patterns and generalize to a broader population.
2. **Design and Creation:** This approach focuses on developing new IT products or artifacts, such as computer-based systems or innovative elements of the development process.
3. **Experiment:** Experimentation aims to investigate cause-and-effect relationships by testing hypotheses and determining causal links between variables. It typically involves before-and-after measurements and rigorous control over influencing factors.
4. **Case Study:** Case studies delve deeply into a single instance or "case" to gain a rich understanding of its complexities, relationships, and processes. This can involve studying organizations, systems, projects, or specific events.
5. **Action Research:** Action research involves conducting research within real-world settings, where researchers actively engage in planning, implementing, and reflecting on actions taken to bring about change or improvement.
6. **Ethnography**: Ethnographic research focuses on understanding the culture and perspectives of a group by immersing oneself in their environment and actively participating in their activities.

Each research question typically corresponds to one research strategy, although it's possible to use multiple strategies if the research plan embodies more than one question. For example, a researcher investigating the use of Intranets in Personnel Departments might employ a case study to understand specific issues within a company and then conduct a survey to assess the broader prevalence of these issues across similar organizations. This flexibility allows researchers to tailor their methods to the specific aims of their study.

**Data generation methods**

Data generation methods are essential for producing empirical evidence in research, which can be quantitative or qualitative. Quantitative data consists of numeric information, while qualitative data encompasses words, images, and other non-numeric forms. This book explores four main data generation methods:

1. **Interviews:** Conducted as structured conversations between the researcher and participants, interviews can be one-on-one or group-based, allowing for controlled questioning to gather insights (Chapter 13).
2. **Observations:** Involves watching and paying attention to actual behaviors and actions rather than relying solely on reported behaviors, often engaging multiple senses (Chapter 14).
3. **Questionnaires:** Utilizes predefined sets of questions presented in a predetermined order, often employing multiple-choice options for respondents to provide data that can be analyzed and interpreted (Chapter 15).
4. **Documents:** Encompasses existing documents pertinent to the research topic, such as policy documents or meeting minutes, as well as documents created specifically for the research task, like researchers' logbooks or multimedia sources (Chapter 16).

While certain data generation methods may align more closely with specific research strategies, such as observations with experiments or questionnaires with surveys, it's common for one strategy to employ multiple methods. For instance, action research in an organizational setting might involve interviews, observations, questionnaires, and document analysis. Employing multiple methods allows researchers to explore phenomena comprehensively and potentially enhance the quality of research findings.

* Method triangulation: the study uses two or more data generation methods.
* Strategy triangulation: the study uses two or more research strategies.
* Time triangulation: the study takes place at two or more different points in time.
* Space triangulation: the study takes place in two or more different countries or

cultures to overcome the parochialism of a study based in just one country or

culture.

* Investigator triangulation: the study is carried out by two or more researchers who

then compare their accounts.

* Theoretical triangulation: the study draws on two or more theories rather than one

theoretical perspective only.

Moreover, utilizing more than one data generation method facilitates method triangulation, wherein researchers corroborate or question findings by comparing data from different methods. Triangulation can occur through various approaches, including method, strategy, time, space, investigator, and theoretical triangulation, each providing multiple perspectives on the research question (Chapter 16). The interpretation of triangulated findings may vary depending on the researcher's underlying philosophical stance, with positivists seeking consistency across methods and interpretivists acknowledging the existence of multiple realities and potential divergence in findings (Chapters 19 and 20).

**Data analysis**

Data analysis is a critical phase in the research process where generated data is examined for relationships or themes. Quantitative data analysis employs statistical methods, while qualitative analysis seeks themes within words or images. Both approaches are detailed in Chapters 17 and 18. It's noteworthy that quantitative analysis can be applied to qualitative data as well, enabling researchers to count occurrences of specific phrases, for instance.

Conceptual frameworks guide data analysis by suggesting relationships or themes, but researchers should remain open to unexpected findings that may challenge or extend existing theories. Grounded theory, for example, advocates for analyzing data without preconceived notions. The research process, depicted in Figures 1.4 and 3.1, appears linear, but, it’s iterative, with plans evolving and researchers moving between different components.

**Alternative Models of the Research Process**

There are alternative models to characterize the research process. One model involves conceptualizing, operationalizing, and generalizing the research topic. It begins with defining the research question, implementing research strategies, and ends with assessing broader implications beyond the project's scope. Another model draws an analogy with the Systems Development Life Cycle (SDLC), emphasizing stages like analysis, design, implementation, and testing, which have corresponding phases in research, such as analyzing existing knowledge, developing research proposals, and evaluating outcomes.

**Design**

The design phase, analogous to the Systems Development Life Cycle (SDLC), involves conceptualizing the planned system or research approach. Initially, it outlines the strategy to be used and then progresses to more detailed planning, such as specifying data generation methods within the chosen strategy.

**Implementation**

Implementation, in both SDLC and research, involves executing the designed plan. In SDLC, this means developing the software according to the design, while in research, it entails carrying out the research activities, such as issuing questionnaires or conducting interviews.

**Testing**

Testing, the final stage, assesses the functionality and effectiveness of the system or research. In SDLC, the system is evaluated to ensure it meets requirements and is accepted by users. Similarly, research is evaluated to determine if it has adequately addressed the research question and is deemed valid by the academic research community.

**Evaluating the Research Process**

Analyzing and evaluating the research process involves assessing how well other researchers have described their process. An 'Evaluation Guide' can aid in this evaluation.

**Chapter 4 – Internet Research**

**Introduction**

The last chapter provided an overview of the research process and its components. Before delving into detailed discussions of each component, the focus shifts to the Internet as a significant area of interest for IS and computing researchers. The Internet presents both new research topics and innovative research methodologies. Many readers of the book are expected to conduct research related to or supported by the Internet. Therefore, this chapter aims to consolidate themes and issues relevant to Internet research, with more in-depth exploration provided in subsequent chapters.

**Background to the Internet and World Wide Web**

The Internet is a global network of interconnected computers that allows communication through various protocols, facilitating activities such as web browsing, email, and multimedia content consumption. Its origins trace back to Vannevar Bush's vision in 1945 and the development of packet switching in the 1960s, leading to the creation of Arpanet in 1969. Tim Berners-Lee proposed the World Wide Web in 1989, introducing hypertext for seamless navigation between webpages. The commercialization of the Internet began in the early 1990s, marked by the 'dot.com boom' followed by a crash, leading to widespread use by businesses and individuals. Today, the Internet serves various purposes, including e-commerce, communication, entertainment, and information dissemination. However, it also poses challenges such as security risks and concerns about inappropriate content. Despite these challenges, the Internet offers vast research opportunities across numerous domains.

**Internet Research Topics**

The text outlines various research topics related to the Internet and its impact on society, business, and technology. It discusses areas such as mobile computing, web services, e-commerce, and email behavior, highlighting research opportunities in understanding user behaviors and developing better systems. Additionally, it explores the influence of the Internet on communities, governments, and the arts, emphasizing the diverse range of research possibilities. Furthermore, it touches upon the Internet's role in education, communication, and philosophical inquiry. Overall, the text underscores the significance of the Internet as a rich source of research topics across multiple disciplines.

**The Internet and a Literature Review**

The text highlights the benefits of utilizing the Internet and web resources for conducting literature reviews. It mentions how researchers can access published works, journals, conference papers, and academic databases online from their own locations. Additionally, it discusses the convenience of online catalogs and databases in finding relevant research materials. However, it also warns about the presence of poor-quality content on the web, emphasizing the importance of verifying the credibility and authenticity of online sources. Furthermore, it indicates that Chapter 6 provides more detailed information on conducting literature reviews, including utilizing the Internet for this purpose.

**The internet and Research Strategies and Methods**

The text discusses the utilization of the Internet and web for various research strategies and methods. It outlines six research strategies, including survey, design and creation, experiment, case studies, action research, and ethnography, highlighting that each can be Internet-based. Additionally, it mentions four data generation methods - interviews, observations, questionnaires, and documents - which can also be conducted via the Internet. Tables are provided summarizing the possibilities and limitations of employing these strategies and methods online. Furthermore, it indicates that subsequent chapters delve into these topics in more detail, offering comprehensive insights into conducting research utilizing Internet resources.

**Internet Research, the Law and Ethics**

The text discusses the legal and ethical challenges associated with conducting research on or about the Internet. It highlights the global nature of the Internet, where legal standards vary across countries, leading to potential conflicts in research practices. The passage emphasizes how the evolving nature of the Internet often outpaces legal regulations, requiring analogies from offline activities to determine legality in online contexts. Furthermore, it underscores the ongoing debates surrounding ethical considerations in Internet research, such as obtaining informed consent and ensuring anonymity and confidentiality for participants. The text suggests that navigating these challenges requires careful consideration and adherence to evolving ethical standards, which will be further discussed in Chapter 5 of the text.

**Chapter 6**

**Purpose of chapter 6:**

* Why we use the literature
* How to conduct a literature review

Two parts:

**First part**

1. Explore literature to look for a research idea. To help a student get a feel of the area and define a research problem, this idea can be found in journals or cited by authors who have reviewed previous work in this topic. Thanks to this a student can define a research problem.
2. Once a topic is chosen (which takes time). Aim is to gather evidence that supports your claim. Be able to propose and maintain an argument is by presenting evidence from the literature. A way to support the claim is that:

* the topic is worthwhile
* DRY (do not repeat) the work of others
* create new knowledge that wasn’t present before

A literature review provides a foundation to the research. To cite relevant work is a **priority** (list can’t be too short or outdated). One must be able to discover, analyze and evaluate what has been done before. To justify this into a coherent account to be placed in context this should be synthesized (whatever that means).

From the book: “*You will be assessed on your ability to discover, analyze and*

*evaluate what has been done before, and also to synthesize this into a coherent*

*account that justifies your own research and places it in context. As explained in*

*Chapter 3, your literature review should help provide the conceptual framework for*

*your research.*”

**Literature resources:**

Wide range of sources:

* ***Books*** - Textbooks provide introductory information on a field's theories and methods but are rarely cited in literature reviews due to their student-focused nature. Instead, academic researchers should reference monographs, which offer in-depth theoretical discussions and extensive references, although caution is advised regarding potential outdated content.
* ***Manuals*** - Manuals are valuable for practical projects requiring software or system usage but are not typically cited in academic literature reviews due to their lack of scholarly validation and insight into current trends.
* ***Journals*** - Academic journal articles provide current research and insights in a field, often constituting most of a literature review, while publications such as MISO Review and ACM Computing Surveys offer surveys of literature on specific topics. Refereed articles, peer-reviewed by academics, hold higher credibility, though they may become outdated due to publication timelines, contrasting with practitioner-focused publications which may lack peer review and detailed research methodology, thus are less suitable for academic literature reviews.
* ***Conference and workshop proceedings*** - Conference and workshop proceedings often provide the most recent theories and suggestions for further research, but their quality and accessibility can vary, with some undergoing peer review for higher credibility while others lack it and may have limited availability online. Obtaining copies of papers can be challenging, as some proceedings are published as books, while others may only provide abstracts or titles online, and contacting authors directly may be necessary for access.
* ***Reports*** - Reports from market research, consultancy groups, and governments can provide valuable insights but may be difficult to access and should be treated with caution due to potential biases and vested interests. While government publications may seem credible, their statistics can be misleading, requiring researchers to critically evaluate the clarity of measurements and consider possible biases when utilizing such resources.
* ***Newspapers, magazines, radio and television*** - Newspapers, magazines, and broadcast programs can offer valuable up-to-date information, but their potential political or geographical biases and lack of peer review generally limit their use in literature reviews.
* ***Art exhibition catalogues*** - Art exhibition catalogues offer personal statements from artists, essays on their art, and critiques by art critics, but these perspectives are not peer-reviewed and reflect subjective views.
* ***Multimedia ‘literature’*** - The concept of a literature review has expanded to encompass multimedia sources such as images, films, software, and sound clips, which are particularly important for researchers in design and creation fields to explore for insights and inspiration.
* Resource catalogues and ***online databases*** - Catalogues provide information about library holdings and online access to other libraries' catalogues, while online databases offer access to academic publications and conference papers, aiding researchers in finding relevant resources and abstracts before ordering full articles. Examples of online databases include ACM Digital Library, Business Source Premier, INSPEC, ISI Web of Knowledge, and Design and Applied Arts Index, with academic communities often compiling reference lists on specific topics, accessible online.
* **Academic gateways**, such as the Pinakes.Subject launchpad, are curated websites providing links to high-quality information chosen by academics in specific subject areas, particularly relevant for accessing better quality information in fields like information systems and computing.

We can break a literature review down into seven different activities, each of which is

discussed in this section:

1. **searching**

* conducting effective research, starting with exploring university library resources then expanding to online databases and search engines. It emphasizes the importance of defining search terms and concepts, considering alternative terms, and selecting appropriate resources. It suggests refining searches based on initial results, utilizing symbols and Boolean operators for advanced searches, and recording search terms for methodical research. Additionally, it advises exploring references found, including keywords suggested by authors, following citation trails for more relevant material, and using citation indexes to expand research. Ultimately, it highlights the transition from finding suitable references to managing the abundance of discovered material.

1. **obtaining**

* *the text advises obtaining potentially useful references by checking the library catalogue for items held locally, utilizing inter-library loan services for those not available, with possible restrictions and time delays, while suggesting accessing articles more quickly via the web, often available on authors' university webpages.*

1. **assessing**

* *the text emphasizes the importance of assessing the credibility of various sources in research. For books, it suggests considering the author's expertise, publisher reputation, and edition status. For journal articles, factors such as target audience, editorial board quality, and peer review process are highlighted. Similarly, for conferences and workshops, the focus is on academic versus practitioner orientation, establishment, and program committee credibility. Internet sources require additional scrutiny, considering ownership, authority, purpose, and timeliness.*

1. **reading**

* *the text advises a strategic approach to reading academic literature, suggesting to quickly identify key information by focusing on abstracts, introduction, conclusions, section headings, and key sentences within paragraphs, particularly for journal articles and conference papers. For books, utilizing the index for topic coverage evaluation can help determine whether reading the entire text is necessary.*

1. **critically evaluating**

* *the text emphasizes the importance of critically evaluating literature for relevance to one's research, considering its usefulness, potential flaws, and omissions. It encourages questioning the paper's conclusions, identifying false logic or unwarranted assumptions, despite initial hesitancy to criticize published work, highlighting the role of increasing familiarity with the literature and utilizing evaluation checklists provided in the book to assess each paper thoroughly.*

1. **writing a critical review**

* *the text delineates the process of writing a critical literature review, emphasizing its purpose in supporting the creation of new knowledge and directly addressing research objectives. It advises against a mere summary of literature and suggests structuring the review around concepts rather than authors. Additionally, it recommends creating a coherent argument by funneling from general ideas to specific research questions and proposes the use of matrices to map concepts covered by different papers. Finally, it highlights the importance of adhering to the appropriate referencing system, whether Harvard or numerical, as per institutional or journal guidelines.*

1. **never plagiarize**

* *the text warns against plagiarism, defined as using someone else's words or ideas without proper credit, emphasizing its seriousness and potential consequences. It suggests self-monitoring to ensure originality in writing, avoiding excessive reliance on the original source, and correctly citing quotations or paraphrased content to avoid accusations of plagiarism while demonstrating awareness of existing literature.*

**Chapter 19 – Philosophical Paradigms - Positivism**

**Introduction**

In this chapter, the focus is on understanding the underlying philosophy of research, particularly through the lens of the philosophical paradigm known as positivism. The chapter covers several key aspects:

1. **Necessity of understanding philosophical paradigms:** It emphasizes the importance of grasping the philosophical underpinnings of research methodologies.
2. **Scientific method:** The scientific method, a cornerstone of positivism, is introduced as a systematic approach to inquiry that emphasizes empirical observation, hypothesis testing, and the formulation of theories based on empirical evidence.
3. **Positivism:** This philosophical paradigm, characterized by its emphasis on objectivity, empirical observation, and the belief that knowledge can be gained through scientific methods, is explained in detail. Its defining characteristics and principles are explored.
4. **Evaluation of positivism:** The chapter delves into how we evaluate positivism as a philosophical paradigm, considering its strengths and limitations.
5. **Criticism of positivism:** Various criticisms of positivism are discussed, highlighting its potential shortcomings or limitations in certain contexts.
6. **Analyzing and evaluating research based on positivism:** Finally, the chapter examines how research can be analyzed and evaluated within the framework of positivism.

Overall, the chapter serves as a foundational exploration of positivism as a philosophical paradigm in research, offering insights into its principles, criticisms, and implications for conducting and evaluating research.

**‘Do I Have to Study This Philosophical, Airy-fairy Stuff?’**

This excerpt emphasizes the importance of understanding philosophy in the context of information systems and computing research, despite its seeming distance from the practicalities of designing and using such systems. It illustrates this point by comparing two research strategies: experiments and ethnographies.

In experiments, researchers aim for objectivity, removing any potential for their influence on the results. Conversely, in ethnographies, the researcher becomes the instrument of research, with their observations and interactions forming the data. They openly acknowledge their influence on the subjects studied.

Despite the differing roles of objectivity and subjectivity in these approaches, both experiments and ethnographies can be considered valid forms of academic research. The key lies in recognizing that they stem from different philosophical paradigms. A paradigm represents shared assumptions or ways of thinking about the world, influencing research strategies and their evaluation.

The excerpt highlights the significance of ontology (the nature of reality) and epistemology (the ways of acquiring knowledge) in shaping research methodologies. It underscores that different philosophical paradigms lead to varied views on these aspects, which in turn influence the accepted research strategies within specific communities. Thus, understanding philosophical underpinnings is essential for evaluating and conducting research effectively in information systems and computing.

This excerpt underscores the necessity for Information Systems (IS) researchers to grasp the various philosophical paradigms underlying research strategies. While IS research encompasses diverse strategies with differing philosophical foundations, even researchers primarily working within the traditional positivist paradigm must still acknowledge and understand alternative paradigms.

For those concentrating solely on designing and creating IT artifacts, philosophical discussions may seem irrelevant. However, if one aims to cite and evaluate research studies beyond design and creation, an understanding of underlying philosophical assumptions becomes essential.

The computing literature has traditionally overlooked philosophical considerations. Yet, for those seeking to explore IT artifacts' real-world use or understand previous research from alternative perspectives, comprehension of underlying philosophical paradigms is crucial.

The chapter emphasizes three main philosophical paradigms: positivism, interpretivism, and critical research, and discusses how various research strategies align with these paradigms. While these paradigms can be further subdivided, a broad understanding suffices to highlight their main features and how they shape research approaches.

Recognizing the diversity in philosophical assumptions among research communities helps researchers understand differing perspectives on reality, the purpose of research, and what constitutes knowledge. Once researchers determine their research paradigm, they can delve deeper into related literature for further insights.

In summary, while philosophy may seem distant from practical research, understanding philosophical paradigms is crucial for effective evaluation and conduct of research in IS and computing.

**Positivism and the Scientific Method**

Positivism, the oldest of the three paradigms discussed, forms the basis of the scientific method utilized in natural sciences like physics, chemistry, biology, and metallurgy. This method has evolved over the past 400 to 500 years, originating from the works of influential figures such as Bacon, Galileo, and Newton. Due to its long history and widespread application, many perceive it as the sole legitimate approach to research.

However, while the scientific method is highly effective in studying natural phenomena, it may not always be suitable for examining the social world—how people think and act in their environments. Therefore, alternative paradigms discussed in subsequent chapters often prove more appropriate for social research endeavors.

**The scientific method**

The scientific method has two basic assumptions:

* Our world is ordered and regular, not random.
* We can investigate it objectively.

The excerpt discusses two key assumptions of positivism and how they relate to the scientific method.

1. **Regularity and predictability:** Positivism assumes that there are regular laws and patterns in the universe, and the scientific method aims to uncover these. For instance, gravity consistently pulls objects downward, allowing scientists to predict the behavior of falling objects. Similarly, researchers investigate phenomena like the link between vaccines and autism or cannabis use and brain tumors to uncover underlying patterns.
2. **Objectivity:** Positivism asserts that researchers can investigate the world objectively because these laws and patterns exist independently of individual cognition. Researchers can set aside personal biases and emotions to find out how the world works. This objectivity allows scientists to accept evidence even if it contradicts their initial hypotheses.

The scientific method, grounded in positivism, seeks to discover universal laws through experimentation. Researchers formulate hypotheses, conduct experiments to test them, and analyze the results. The ideal approach is to attempt to disprove hypotheses rather than confirm them because no hypothesis can be proven true for all time.

An analogy with swans illustrates the importance of testing hypotheses rigorously. Initially observing only white swans might lead to the assumption that all swans are white. However, encountering a black swan would refute this hypothesis, highlighting the necessity of thorough testing and the willingness to accept contradictory evidence.

This excerpt discusses the inherent uncertainty in scientific knowledge and the fundamental techniques of the scientific method: reductionism, repeatability, and refutation.

1. **Uncertainty and falsifiability:** While something may seem true for a long time and may have evidence to support it, if it's proven false even once, it can never be true again. Researchers must recognize that even well-established hypotheses are susceptible to being disproved or replaced by new theories. Thus, theories and explanations should be viewed as the best knowledge available now, subject to revision considering new evidence.

2. Techniques of the scientific method:

* **Reductionism:** Complex phenomena are broken down into smaller, more manageable parts to facilitate study. For example, understanding how cigarettes cause lung cancer involves studying the individual components of cigarettes and their interactions with the body.
* **Repeatability:** Results of experiments are not relied upon from a single instance; experiments are repeated multiple times to ensure consistency and reliability. Other researchers also attempt to replicate the experiments to verify the results independently.
* **Refutation:** Hypotheses are subject to testing through experiments designed to potentially disprove them. If an experiment cannot be replicated or if evidence contradicts the hypothesis, it may be refuted. The strength of a hypothesis lies in its ability to withstand attempts at refutation.

The scientific method operates through an iterative cycle, involving the formulation of theories, derivation of hypotheses, objective testing, observation of results, confirmation or refutation of hypotheses, and acceptance, modification, or rejection of theories based on the evidence gathered. This cycle allows for the continual refinement and advancement of scientific knowledge.

**Characteristics of Positivism**

Positivism, as a philosophical paradigm underlying the scientific method, encompasses several key characteristics:

1. **Independent existence of the world:** Positivists assert that the world exists independently of human perception. Both physical and social realms exist objectively, irrespective of human presence or observation. For instance, the law of gravity would persist even if humanity were to perish.
2. **Measurement and modeling:** Positivist researchers aim to understand the world through observation, measurement, and the creation of models such as hypotheses and theories. It is assumed that these models accurately represent reality, leading to the belief in a single, ultimate truth for any aspect of the world.
3. **Objectivity:** Positivist researchers strive to maintain neutrality and objectivity. They aim to be impartial observers, capable of discovering facts about the world independent of personal values or beliefs.
4. **Hypothesis testing:** Research within the positivist paradigm relies on empirical testing of theories and hypotheses. This process involves confirming or refuting these propositions based on empirical evidence.
5. **Quantitative data analysis:** Positivists often favor mathematical modeling, statistical analysis, and quantitative data. Mathematics provides a logical and objective framework for analyzing observations and results, facilitating rigorous analysis.
6. **Universal laws:** Positivist research seeks generalizations and universal laws, aiming to identify patterns and irrefutable facts that hold true regardless of the researcher or the context. This pursuit of universal truths contributes to the advancement of scientific knowledge within the positivist framework.

**Judging the quality of positivist research**

Judging the quality of positivist research involves assessing its objectivity, reliability, internal validity, and external validity:

1. **Objectivity:** Evaluates whether the research is free from bias and researcher influence. Researchers should avoid shaping results to align with personal interests or those of sponsoring organizations.
2. **Reliability:** Focuses on the neutrality, accuracy, and consistency of research instruments. This includes ensuring that equipment, questionnaire questions, data analysis techniques, and researchers themselves produce consistent results over repeated use.
3. **Internal Validity:** Examines whether the research was well-designed and executed to accurately investigate the intended aspects of the phenomenon. Researchers must justify claims of causality and ensure that the data collected supports their findings.
4. **External Validity:** Considers the generalizability of research findings to different populations, settings, or time periods. Positivist research seeks high generalizability, and the representativeness of research samples is crucial for achieving this.

The scientific method, rooted in positivism, has greatly influenced modern life and discourse, shaping fields like physics, chemistry, and biology. Its emphasis on objectivity and generalizability is evident in political and journalistic demands for proof and truth. However, while positivism excels in studying the natural world, it may be less suitable for understanding the complexities of the social world, as explored in subsequent sections.

**Criticisms of positivism**

Criticisms of positivism arise from its limited suitability for researching the social world, which involves complex human interactions, cultural dynamics, and subjective interpretations:

1. **Reductionism:** Positivism's tendency to break complex phenomena into simpler components may overlook the holistic nature of social structures and relationships. For instance, studying a family requires understanding the intricate dynamics among its members rather than analyzing individuals in isolation.
2. **Repetition:** Unlike in natural sciences, social phenomena often cannot be repeated for study due to their unique contexts and events. For example, the acceptance of a specific computer system in a company can only be studied once, limiting the ability to replicate findings.
3. **Generalization:** While positivism emphasizes identifying regular laws and generalizable patterns, focusing solely on these may overlook the richness of unique social contexts and experiences. Studying individual cases, even if untypical, can provide valuable insights.
4. **Subjectivity and Interpretation:** People perceive and interpret the world differently, leading to varied viewpoints and meanings. Positivism's emphasis on objective laws may overlook the importance of understanding subjective experiences and interpretations.
5. **Social Construction of Reality:** Many patterns observed in the social world are not inherent laws of nature but are constructed by people. For example, the perception that web-based systems must be developed quickly is a shared view rather than a natural law.

Researchers argue that the social world lacks equivalents to the "laws of nature" found in the physical world. Therefore, alternative research paradigms, such as interpretivism and critical research, have been developed to better understand human experiences and social dynamics. These paradigms, discussed in the next chapter, offer different approaches to studying people and their worlds, acknowledging the complexity and subjectivity inherent in social phenomena.

**Evaluating Positivist Research**

The provided "Evaluation Guide" offers a framework for analyzing and assessing positivist research. Researchers can use this guide to evaluate studies based on the positivist paradigm, even if it's not explicitly stated. The guide suggests considering the following points:

1. **Research Design:** Determine if the research involves experiments or surveys, as these methods are typically associated with positivism.
2. **Objectivity:** Assess whether the research is free from bias and if the researchers have avoided influencing the results.
3. **Reliability:** Evaluate the neutrality, accuracy, and consistency of research instruments, including equipment, questionnaire questions, and data analysis techniques.
4. **Internal Validity:** Determine if the research was well-designed and if the data collected supports the claimed findings, including the justification of causal relationships.
5. **External Validity:** Consider the generalizability of the research findings to different populations, settings, or time periods.

By using this evaluation guide, researchers can analyze and critique positivist research, even when the paradigm is not explicitly stated by the authors. The dominance of positivism means that many studies, especially those employing experiments or surveys, can be deduced to be based on this paradigm.

**Chapter 20 – Alternative Philosophical Paradigms**

This chapter explores two alternative philosophical paradigms to positivism: interpretivism and critical research. It begins by acknowledging the limitations of positivism in studying the complexities of the social world.

Interpretivism is introduced as a paradigm that offers a different view of the world (ontology) and how knowledge is acquired (epistemology). It emphasizes understanding the subjective meanings and interpretations individuals attach to their experiences and behaviors. The chapter outlines the characteristics of interpretivism and discusses how to evaluate the quality of interpretive research.

Additionally, the chapter addresses critical research, another alternative paradigm. It examines its characteristics and how to assess the quality of research conducted within this framework. The relationship between positivism, interpretivism, and critical research is explored, along with how they intersect with various research strategies.

Finally, the chapter provides guidance on how researchers can determine which philosophical paradigm underpins their own work. This involves considering the ontological and epistemological assumptions guiding their research approach.

**Interpretative search:** Interpretive research in IS and computing is concerned with understanding the social context of an information system: the social processes by which it is developed and construed by people and through which it influences, and is influenced by, its social setting.

**Characteristics of interpretivism**

Interpretivism, as a philosophical paradigm, focuses on understanding social phenomena through subjective meanings and interpretations rather than proving or disproving hypotheses. Key characteristics of interpretivism include:

1. **Multiple Subjective Realities:** There is no single version of truth, and what is considered real or knowledge is constructed by individuals or groups. Different groups or cultures may perceive the world differently, leading to diverse interpretations and understandings.
2. **Dynamic, Socially Constructed Meaning:** Reality can only be accessed and transmitted through social constructions such as language and shared meanings. These meanings are not static but evolve across groups and over time.
3. **Researcher Reflexivity:** Researchers are not neutral observers but are influenced by their own assumptions, beliefs, and values. They must reflect on how their biases shape the research process and interact with study participants.
4. **Study of People in Natural Social Settings:** Research aims to understand people in their natural environments, without imposing the researcher's preconceptions. This involves studying phenomena from the perspectives of participants, without external influence.
5. **Qualitative Data Analysis:** Interpretivists often prefer qualitative data analysis, focusing on the words, metaphors, and images used by individuals to understand their experiences.
6. **Multiple Interpretations:** Researchers anticipate that there will be no single fixed explanation for phenomena studied. Instead, they expect to offer multiple interpretations based on the evidence gathered.

Interpretivism seeks to create a rich understanding of unique social contexts and how individuals or groups make sense of their worlds, acknowledging the subjective nature of human experiences and interpretations.

**Judging the quality of interpretivist research**

To judge the quality of interpretivist research, different criteria are needed compared to those used in positivist research. The characteristics of interpretivist research make it challenging to apply traditional criteria such as objectivity, reliability, internal validity, and external validity. Here's why:

1. **Objectivity:** While positivist research aims for objectivity by minimizing researcher bias and distortions, interpretivists acknowledge the inevitability of bias due to the subjective nature of observations and the researcher's interaction with participants.
2. **Reliability:** Positivist research relies on repeatability to establish reliability, assuming a stable truth that can be replicated. However, interpretivists argue that social phenomena are socially constructed and dynamic, making it unlikely for the same situation to occur again in a repeat study. Additionally, the researcher's influence further complicates replication.
3. **Internal Validity:** Positivist research emphasizes the accuracy and match with reality of findings, focusing on establishing causal relationships. In contrast, interpretivists recognize multiple constructed realities and the complexity of real-life situations, making it challenging to isolate individual variables and determine causality.
4. **External Validity:** Positivist research assesses the generalizability of findings to different contexts, depending on the representativeness of research samples. However, interpretivists accept the uniqueness of contexts and individuals' constructions, making identical findings in other contexts less likely.

Given these differences, interpretivist research requires alternative criteria for evaluation. While there is no universally agreed-upon set of criteria, Lincoln and Guba (1985) propose a parallel set of criteria for interpretivist research, including trustworthiness, confirmability, dependability, credibility, and transferability. However, the criteria for judging interpretivist research are still under social construction and are subject to ongoing discussion and refinement within the interpretivist research community.

The quality of interpretivist research is assessed through criteria different from those used in positivist research. These criteria are:

1. **Trustworthiness:** Instead of validity, interpretivists focus on how much trust can be placed in the research findings, considering the subjective nature of observations and the influence of the researcher on the study.
2. **Confirmability:** This criterion evaluates whether enough information is provided about the study to judge if the findings are derived from the data and experiences in the setting. Confirmability can be assessed through a research audit trail, examining raw data, analysis, and research notes.
3. **Dependability:** It assesses how well the research process is recorded and documented, enabling others to trace the entire process through an audit trail, ensuring transparency and accountability.
4. **Credibility:** This criterion examines whether the research accurately identifies and describes the subject of inquiry, achieved through prolonged engagement, triangulation of data sources, and respondent checking of interpretations.
5. **Transferability:** It evaluates whether findings from one case can be transferred to another, considering the uniqueness of contexts and individuals. Detailed descriptions are provided to enable readers to judge the relevance of findings to their own situations.

These criteria aim to establish the plausibility of interpretivist research rather than proof in the positivist sense. Interpretive researchers aim to make arguments and convince their audience of the credibility of their interpretations supported by evidence. Despite criticisms of being "non-scientific," interpretivist research can still be carefully conducted to inspire confidence in its findings.

However, interpretive research is less established than positivist research, leading to challenges in publication and peer review processes. While interpretivism is gaining recognition in some fields, such as social sciences, it remains less known and appreciated, particularly in computing.

**Critical Research**

We turn now to our final philosophical paradigm: critical research (see the definition below). This is less well-known and accepted than interpretivism.

**Definition:** Critical research in IS and computing is concerned with identifying power relations, conflicts and contradictions, and empowering people to eliminate them as sources of alienation and domination.

Critical researchers assert that social reality is shaped by people but also contains objective properties influenced by prevailing systems of authority. They criticize interpretivist researchers for not analyzing power dynamics that regulate and legitimize certain ways of seeing the world. For example, in a golf club setting, while interpretivists would analyze the shared understanding of organizing the club, critical researchers would delve deeper to explain why certain ways of seeing the world dominate and represent organizational reality. They examine societal history to understand how perceptions about gender differences have shaped organizational practices. Moreover, critical researchers aim to challenge and remove barriers to equality by encouraging members to question the status quo and effect changes. Their focus is on power relations, conflicts, and contradictions in society, aiming to identify and challenge conditions of domination and unfairness. Understanding alone is insufficient; critical researchers seek to eliminate causes of alienation and domination by challenging the status quo and taken-for-granted assumptions.

**Characteristics of critical research**

1. **Emancipation:** Critical researchers aim to empower individuals by freeing them from oppressive power relations within organizations and society.
2. **Critique of Tradition:** They challenge existing power structures and taken-for-granted assumptions, such as the notion that systems developers serve both managers and employees equally. Critical researchers argue that developers often inadvertently support managerial interests, leading to increased productivity but restricting employee resistance.
3. **Non-performative Intent:** Critical researchers reject research projects focused solely on enhancing managerial efficiency and control, which prioritize maximum outputs (e.g., profits) with minimal inputs (e.g., reduced manpower). They critique research that serves to maximize managerial power and control.
4. **Critique of Technological Determinism:** They challenge the idea that technological development dictates societal norms and behaviors. Instead, they argue that society can shape technology. Critical researchers highlight how the perception of technological determinism can reinforce power differentials, enabling certain groups to control others.
5. **Reflexivity:** Like interpretivists, critical researchers question the possibility of achieving objective, value-free knowledge. They reflect on how power and vested interests influence research agendas and outcomes. They acknowledge the impact of societal and organizational factors on their research methods and recognize their own role in shaping knowledge outcomes.

**Which Paradigm to Choose?**

The choice of research paradigm depends on several factors:

1. **Nature of Research Question:** The nature of your research question will influence your choice of research paradigm.
2. **Personal Beliefs and Values:** Your own beliefs and values shape how you perceive the world and what kind of knowledge you want to create.
3. **Disciplinary Norms:** Consider whether your discipline typically favors a specific research paradigm.
4. **Willingness to Challenge Status Quo:** Decide if you are willing to take risks and challenge existing assumptions and practices.

In computing research, many researchers focus on creating IT artifacts without considering the underlying research philosophy. However, for justification and evaluation of IT artifacts, additional research strategies reflecting interpretive and critical paradigms may be necessary. While positivism is predominant, interpretivism and critical research offer valuable perspectives in understanding computing practice and challenging power structures. Novice researchers may find it safer to start with a positivist approach but can gradually explore interpretive and critical paradigms as they gain experience.

In Information Systems (IS), interpretivism has gained acceptance over the years, but positivism still predominates, especially in the USA. Critical research in IS (Information Systems) is emerging but considered riskier for novice researchers. Combining research paradigms is debated, with some arguing for compatibility and others asserting incompatibility. Researchers should justify their choice of combining paradigms if they opt for this approach.

Evaluation of interpretive and critical research involves analyzing whether the study aligns with its claimed underlying paradigm. Researchers usually explain their chosen paradigm within their paper or thesis, allowing readers to understand the perspective from which the research is conducted.