

55. Writing Special Paragraphs and Parts

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- 1) Writing Abstracts
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 - 1) Hooks and Funnels
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 - 4) Roadmap paragraphs
- 3) Writing Thesis paragraphs
- 4) Writing Definitions
- 5) Writing Discussions
- 6) Writing Conclusions

Obligatory Literature

- ▶ [Parks] Franklin-Parks. Writing Structured Paragraphs and Essays.
- ▶ [Schaum] Molly McClain, Jacqueline D. Roth. Schaum's Quick Guide to Writing Great Essays. McGraw-Hill.
- ▶ [Turner] Adam Turner. English Solutions for Engineering and Sciences Research Writing: A guide for English learners to publish in international journals. English Writing Lab Center for Teaching and Learning and College of Engineering, Hanyang University, Seoul, Korea
 - www.hanyangowl.org
- ▶ Erlyn Baack. Advanced Composition for Non-Native Speakers of English. eslbee.com Website
- ▶ [SweetSpot] Martin J. Eppler. Die Sweet Spot Methode: Innovation in der Exklusivzone. OrganisationsEntwicklung 01/2015.
 - www.zoe-online.org/Content/ShowPdf.aspx?_s=689791

- ▶ [Vigenschow-Schneider-Meyrose] Uwe Vigenschow, Björn Schneider und Ines Meyrose. Soft Skills für IT-Führungskräfte und Projektleiter: Softwareentwickler führen und coachen, Hochleistungsteams. dpunkt-Verlag.
- ▶ Chapter “Definitions” in Bünting (Schreiben im Studium, Cornelsen)
- ▶ Walter Dubislav. Die Definition. Felix-Meiner-Verlag
 - Formale Logik (Syllogismus) und formale Definitionen wurden als Forschungsgebiete von Aristoteles entdeckt. Aber nur ersteres hat sich stark entfaltet.
- ▶ [Mills-Logic] John Stuart Mills. A System of Logic. 1882. Harper&Mills. eBooks@Adelaide. The University of Adelaide Library

- ▶ [Newman] William Newman. A preliminary analysis of the products of HCI research, using pro forma abstracts. In Proceedings of the SIGCHI conference on Human factors in computing systems: celebrating interdependence, CHI '94, pp 278-284, New York, NY, USA, 1994. ACM. <http://dl.acm.org/citation.cfm?id=191766>
- ▶ [ShawGR] Mary Shaw. What makes good research in software engineering? Int. Journal of Software Tools for Technology Transfer (STTT), 4(1):1-7, 2002. <http://dx.doi.org/10.1007/s10009-002-0083-4>
- ▶ [Shaw-Slides] Mary Shaw. Writing Good Software Engineering Research Papers. Slides from and ETAPS 2002, keynote speech, and a newer version from <http://spoke.compose.cs.cmu.edu/ser04/L02/L2-0113-se-strat.pdf>

Gutenberg.org References

- ▶ [Abbot-NavalHistory] Author: Willis J. Abbot. The Naval History of the United States. Volume 1 (of 2). <http://www.gutenberg.org/2/2/3/0/22305>
- ▶ Willis J. Abbot. Aircraft and Submarines. The Story of the Invention, Development, and Present-Day Uses of War's Newest Weapons
 - <http://www.gutenberg.org/cache/epub/30047/pg30047.txt>

Der Tanz (Christian Morgenstern)

Ein Viertelschwein und eine Auftakteule
trafen sich im Schatten einer Säule,
die im Geiste ihres Schöpfers stand.
Und zum Spiel der Fiedelbogenpflanze
reichten sich die zwei zum Tanze
Fuß und Hand.

Und auf seinen dreien rosa Beinen
hüpfte das Viertelschwein graziös,
und die Auftakteul' auf ihrem einen
wiegte rhythmisch ihr Gekrös.
Und der Schatten fiel,
und der Pflanze Spiel
klang verwirrend melodiös.

Doch des Schöpfers Hirn war nicht von
Eisen,
und die Säule schwand, wie sie gekommen
war;
und so mußte denn auch unser Paar
wieder in sein Nichts zurücke reisen.
Einen letzten Strich
tat der Geigerich --
und dann war nichts weiter zu beweisen.

55.1 Writing Abstracts

was treated in Chapt. 30.



55.2 Writing Introduction Paragraphs

for sections and chapters



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Introduction Paragraphs Play a Similar Role As Introductions of Paragraphs

- ▶ An essay or a section needs an introductory paragraph. Writing it is similar to writing issues of paragraphs
 - The style elements of paragraph introductions (issues) can be used, the Funnel introduction and the Hook introduction.
- ▶ **Funnel paragraphs**
- ▶ **Hook paragraphs**
 - Generalization Hook Paragraph
 - Personal Insight Hook Paragraph
 - Anecdote Hook Paragraph
 - Quotation Hook Paragraph
 - Gripping Facts and Data Paragraph)
 - Question Paragraph
 - Setting-the-scene Paragraph
 - Surprise hook Paragraph
 - Humor hook Paragraph

Introductory Paragraphs, Funnel and Hook Paragraphs end with the thesis of the essay or section.

55.2.1 Writing Direct Introduction Paragraphs

for sections and chapters



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Introductory Direct Paragraph – Development by Example

- ▶ [Abbot-airplanes-submarines]
- ▶ <point>The conquest of the air has been the dream of mankind for uncounted centuries. <repeated point>As far back as we have historic records we find stories of the attempts of men to fly. The earliest Greek mythology is full of aeronautical legends, and the disaster which befell Icarus and his wings of wax when exposed to the glare of the midsummer sun in Greece, is part of the schoolboy's task in Ovid. We find like traditions in the legendary lore of the Peruvians, the East Indians, the Babylonians, even the savage races of darkest Africa. In the Hebrew scriptures the chief badge of sanctity conferred on God's angels was wings, and the ability to fly. If we come down to the mythology of more recent times we find our pious ancestors in New England thoroughly convinced that the witches they flogged and hanged were perfectly able to navigate the air on a broomstick--thus antedating the Wrights' experiments with heavier-than-air machines by more than 250 years.

Introductory Paragraph of a Book

A Long Introduction, Controlling Subject

- ▶ [Ledderhose-Melanchton] What is the issue? Transition? Point? Funnel?
- ▶ Karl Friedrich Ledderhose. The Life of Philip Melanchthon. Translated by Gottlob Frederick Krotel. <http://www.gutenberg.org/3/9/7/3/39734/>
- ▶ Luther occupies so great, unrivalled, and apostolical a position among the Reformers, that we should not feel surprised to see his life and labors presented to the evangelical community again and again. Although we are far from encouraging an idolatrous worship of the man, we believe we are acting in the spirit of the word of God, when we encourage men to follow his faith. But we should act very ungratefully if, on account of this Prince in Israel, we should lose sight of the other distinguished men of God in the days of the Reformation. And among these, PHILIP MELANCHTHON occupies the highest place. The age in which he lived called him the Teacher of the German people, because he exerted a powerful influence upon the scientific and Christian culture of Germany. And we too may give him the same name, for his writings continue to exert a great influence, and justly claim our consideration. To show that this is indeed true, that he is still calculated to be the teacher of the German people, especially of the evangelical community, is the object of this Biography. As this volume was prepared for the general reader, all learned discussions were necessarily avoided. It does not enter into critical investigations, but faithfully appropriates known facts, in order to present them to the reader in an intelligible manner. A candid examination must decide how far the author has succeeded in accomplishing this object. It is the first attempt of the kind, for the Life of Melanchthon has not been written often; and when it was written, it was not treated in a popular manner.

Introductory Direct Paragraph of a Book with Cool First Sentence with Sting Last

- ▶ [Abbott-Airplanes-Submarines]
- ▶ Not since gunpowder was first employed in warfare has so revolutionary a contribution to the science of slaughtering men been made as by the perfection of aircraft and submarines. The former have had their first employment in this world-wide war of the nations. The latter, though in the experimental stage as far back as the American Revolution, have in this bitter contest been for the first time brought to so practical a stage of development as to exert a really appreciable influence on the outcome of the struggle.

Direct Introductory Paragraph of an Essay with Controlling Concept

- ▶ [Abbott-Writing]
- ▶ **Writing clearly does not imply thinking clearly.** A man may think and reason as obscurely as Dogberry himself, but he may (though it is not probable that he will) be able to write clearly for all that. Writing clearly--so far as arrangement of words is concerned--is a mere matter of adverbs, conjunctions, prepositions, and auxiliary verbs, placed and repeated according to definite rules.[1] Even obscure or illogical thought can be clearly expressed; indeed, the transparent medium of clear writing is not least beneficial when it reveals the illogical nature of the meaning beneath it.

Introductory Direct Paragraph of a Book

- ▶ [Abbott-Writing]
- ▶ *Almost every English boy can be taught to write clearly*, so far at least as clearness depends upon the arrangement of words. Force, elegance, and variety of style are more difficult to teach, and far more difficult to learn; but clear writing can be reduced to rules. To teach the art of writing clearly is the main object of these Rules and Exercises.

Introductory Direct Paragraph of a Chapter

Anecdotal Hook

- ▶ [Abbot-NavalHistory] Anecdotal hook *after* the point
- ▶ In treating of the history of the navy during the war of the Revolution, we must always bear in mind the fact, that, during the greater part of that war, **<point>there was no navy.</point>** **<anecdotal hook>**Indeed, the subject presents much the same aspect as the celebrated chapter on snakes in Ireland, which consisted of exactly six words, "There are no snakes in Ireland." So many of the episodes and incidents of the Revolutionary war that we chronicle as part of the naval history of that struggle are naval only in that they took place on the water. The participants in them were often longshoremen, fishermen, or privateersmen, and but seldom sailors enrolled in the regular navy of the united colonies. Nevertheless, these irregular forces accomplished some results that would be creditable to a navy in the highest state of efficiency and discipline

A Bold Scientific Thesis Paragraph at the End of the Suspended Introduction

[Dalton]

<problem>Unfortunately, those who have been best able to teach the science of swimming, because of having technical knowledge and proficiency, have not made systematic attempts to disseminate knowledge through scientific methods. <contribution general> In this respect the author claims to differ with most other instructors. <contribution specific> He has endeavored, in this work, to treat the subject scientifically and to use simple and concise language. <validation>His success as a teacher is attested by thousands of pupils who have acquired the principles of a system long known as the Dalton system.

Nice Introductory Paragraph of Book

[Schmucker] The Organization of the Congregation in the Early Lutheran Churches in America. From the Lutheran Church Review, July, 1887. Philadelphia.

The Lutheran Church in this country has had an opportunity, as never before in its history, to determine for itself the whole form of its organization, uncontrolled by any external forces. In the old world the intimate and organic union of the church with the State left little liberty in this respect. When, therefore, the early Lutheran immigrants in this country were disposed to form themselves into congregations, to adopt regulations for their own government, to settle their relations to other Lutheran congregations, to determine the order of worship to be observed, they had to feel their way in the dark. No little time passed before all these matters became settled on a permanent basis. To follow them in their efforts to obtain a satisfactory organization of the congregation, is what I propose now to do.

Exc.: Introductory Paragraph of a Essay

- ▶ [Tomlinson-Sea] Concessive first sentence (transition)
- ▶ What is the issue? Transition? Point? Funnel?
- ▶ Though it is easier, and perhaps far better, not to begin at all, yet if a beginning is made it is there that most care is needed. Everything is inherent in the genesis. So I have to record the simple genesis of this affair as a winter morning after rain. There was more rain to come. The sky was waterlogged and the grey ceiling, overstrained, had sagged and dropped to the level of the chimneys. If one of them had pierced it! The danger was imminent.

55.2.2 Writing Suspended Introduction Paragraphs

for sections and chapters



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Law of Stress-Last for Introductory Paragraphs

- ▶ “the stich is in the tail”

Often, introductory paragraphs are suspended paragraphs, i.e., contain the thesis of section/book at their end

- ▶ Such introductions suspend and create tension, however, they must be planned carefully.

Introductory Suspended Paragraph with Question as Sting

- ▶ [VannevarBush] Introductory Paragraph of “As we may think”
- ▶ A strategic article thinking about the future of science. The thesis is clearly expressed at the end of the first paragraph.
- ▶ This has not been a scientist’s war; it has been a war in which all have had a part. The scientists, burying their old professional competition in the demand of a common cause, have shared greatly and learned much. It has been exhilarating to work in effective partnership. Now, for many, this appears to be approaching an end. **What are the scientists to do next?**

Introductory Suspended Paragraph

- ▶ [Aßmann] Introductory Paragraph a section
- ▶ Lean Textual Modeling goes several important steps beyond semi-structuring of texts with markup languages because it transfers the control over the text structure from tags to island grammars, framing, and conceptualizes procedures. SGML- and XML-texts are semi-structured by tags, i.e., their structure is expressed by pairs of tags which annotate ranges of texts and give them additional static semantics. Lean Textual Modeling goes a step beyond traditional markup languages, because it uses island-parsable, non-framed and semi-conceptualized text. **What does this mean?**

Introductory Suspended Paragraph of a Chapter Subject Last, with Roadmap

- ▶ [Ledderhose-Melanchton] What is the issue? Transition? Point? Funnel?
- ▶ Karl Friedrich Ledderhose. The Life of Philip Melanchthon. Translated by Gottlob Frederick Krotel.
<http://www.gutenberg.org/3/9/7/3/39734/>
- ▶ In a hilly part of the Kraichgau lies the city of BRETTEEN. In former times it belonged to the Electors of the Palatinate, and in the year 1504 defended itself bravely against Duke Ulrich of Württemberg, and also manifested a brave loyalty to its hereditary sovereign in the war of the peasants. It is now included in the Grand-Duchy of Baden. **<thesis>It has acquired an imperishable name, because a great man, PHILIP MELANCHTHON, was born in it.</>** **<roadmap sentence>We will begin by hearing what an old account relates of his ancestors and parents, his birth and youth.</>**

Hypothetical Strawman (Rebuttal) with Suspended Paragraph (Point-Last)

- ▶ [Stresemann]
- ▶ Es ist diesen Anzeigen eines gemeinsam: fast durchweg empfehlen sie auswärtige Biere, es wird Stettiner, Kottbuser, Potsdamer, Fürstenwalder, Augsburger, Crossener und Köstritzer Bier empfohlen, daneben Porter und Ale. **<rebuttal> Jedoch wäre es falsch, aus dieser Tatsache folgern zu wollen, dass das Flaschenbierlieferungsgeschäft sich zuerst bei den auswärtigen Bieren eingebürgert hätte.</>** Auch in den Zeiten, als das Flaschenbierlieferungsgeschäft längst eine grössere Bedeutung erlangt hatte, wird man vergebens nach Anzeigen suchen, welche das Berliner Weissbier empfehlen. Wenn in diesen frühen Jahren und auch später in den Annoncen nur von auswärtigen Bieren die Rede ist, so beweist dies nur, dass diese Biere zu ihrer Einführung fortgesetzter Reklame bedurften, während die Weissbierlieferungsgeschäfte eine solche für unnötig hielten. Auf der anderen Seite lässt die zum Teil intensive Benutzung der Reklame seitens der Niederlagen für auswärtige Biere auch einen Schluss auf ihre kaufmännische Überlegenheit zu.

A Introductory Upward Paragraph of a Book with Message Sentence

[Schmid-Darwin] Thesis sentence (with comparative subclause for thrust) at the beginning and a message at the end.

Darwin's theory soon found an enthusiastic corps of followers--on the continent, and especially in Germany, almost more than in his own country. The outlook into an entirely new explanation of the origin of man, and the probable use of this theory for attacks upon faith in a Creator and Master of the world, called wide-spread attention to it; and the theory opened to natural science itself entirely new impulses and paths, and promised the solution of many problems before which it had hitherto been compelled to stand in silence. **<message>To be sure, it threatened likewise to allure the mind from the slow but sure ways of solid study to the entertaining but insecure and aimless paths of imagination and hypothesis.</message>**

55.2.3 Writing Hook and Funnel Paragraphs



Hook Paragraphs Capture the Reader's Interest

- ▶ For example (Rpt:)
- ▶ Quotation Hook Paragraph:
 - Though Willy Brandt said in 1990 “Es wächst zusammen, was zusammen gehört”, it looks like Dresden is an exception of this. Dresden has a bombing complex.
- ▶ Use multiple explicit questions in a paragraph.
 - Why do the church bells ring in Dresden every year on February 13? Of course, they should remind everybody on the destruction of the town in 1945. But many other German towns were destroyed, too, and none of them keeps the same tradition. So, what's special? Dresden has a bombing complex.

Hook Paragraphs Capture the Reader's Interest

- ▶ For example (Rpt:)
- ▶ Anecdote Hook:
 - When in 2005, the Dresdner Frauenkirche had been completely rebuilt, thousands took part in the inauguration event. The church was full and around the church, on a sunny Sunday, many had gathered to listen to the sermons and concerts. The solemn silence was broken by the trumpet player Güttler triumphantly playing Purcell's suite. You could hear a needle fall. You could hear East Germany resurrect, 60 years after the end of the war. Why was this such an overwhelming event? Well, Dresden has a bombing complex.
 - <<more paragraphs>>
- ▶ Facts and Data Hook (“gripping” fact):
 - Every year on February 13, Dresden stands still for half an hour. The church bells ring reminding everybody on the destruction of the town in 1945. Only after 60 years later, the main church, the Frauenkirche, could be rebuilt – it had laid around in pieces in the middle of the town as “antifascistic memorial”. Since several years, Neonazis use this day to demonstrate against the humiliation of Germany in 1945 and the allies who bombed the town; other groups demonstrate against the Neonazis and the police has a difficult job to keep the parties apart. Last year, a helicopter monitored the center of the town for a full day, to make the police able to react quickly, if necessary. Dresden has a bombing complex.
 - <<more paragraphs>>

Setting-the-Scene-Paragraphs

- ▶ **Setting-the-scene (background) paragraph:** It shows a development in the context of the work which brings up the problem of the work. Background and problem make motivation.

Motivation = Background + Problem

Motivation = Background + Problem + Blocking factor

Funnel Introductions Capture the Reader's Interest

- ▶ Example:
- ▶ Funnel paragraph, narrowing on time and on topic:
 - In the past, laws could not often be enforced because the governments were too weak to control all events in the country. Since the advent of the computers, crimes can be detected much easier because the databases of the police enable powerful querying and data matching. Since 2000, DNA analysis allows to prove all father-child relationships. Now, a raping man can be sentenced if a child has resulted from his crime.
- ▶ Funnels can be on many micropatterns:
 - General → particular (generalization)
 - Abstract → detailed (abstraction)
 - Superclass → subclass (classification)
 - Superset → subset
 - Whole → part

Funnel introduction Paragraph

- ▶ Mark Twain. The Adventures of Tom Sawyer.
- ▶ www.gutenberg.org/cache/epub/74/pg74.txt
- ▶ Saturday morning was come, and all the summer world was bright and fresh, and brimming with life. There was a song in every heart; and if the heart was young the music issued at the lips. There was cheer in every face and a spring in every step. The locust-trees were in bloom and the fragrance of the blossoms filled the air. Cardiff Hill, beyond the village and above it, was green with vegetation and it lay just far enough away to seem a Delectable Land, dreamy, reposeful, and inviting.
- ▶ Tom appeared on the sidewalk with a bucket of whitewash and a long-handled brush. He surveyed the fence, and all gladness left him and a deep melancholy settled down upon his spirit. Thirty yards of board fence nine feet high. Life to him seemed hollow, and existence but a burden. Sighing, he dipped his brush and passed it along the topmost plank; repeated the operation; did it again; compared the insignificant whitewashed streak with the far-reaching continent of unwhitewashed fence, and sat down on a tree-box discouraged.
- ▶ How is the appearance of the main person/topic prepared?
- ▶ What is the funnel's focus? Which paragraph types?

Funnel Introduction

- ▶ Treppauf-sentence with background in the subclause, more concrete thesis in the main clause. Afterwards, funneling
- ▶ `<funnel><I>`While Miranda's ambitious schemes were drawing the notice of the State department towards the seaboard, a more serious filibustering scheme was quietly hatching in another quarter, in the brain of one of the boldest and ablest adventurers known to American history.`<2>` The imperial crown of the Montezumas was the prize for which an ex-vice-president of the United States risked fame, fortune, everything—and lost!`</funnel><thesis>` The story of Aaron Burr is a matter of familiar history. His demoralized forces surrendered at Bayou Pierre, on the Mississippi, on January 17, 1807. `</thesis>` Acquitted of the charge of treason, for which he was tried, but condemned by the unanimous opinion of his contemporaries, the sober judgment of history must pause before endorsing either verdict. The relations of Spain and the United States were in a hopelessly tangled state. Burr proposed to settle the disputed question of territorial rights by conquering the whole of Spanish North America, a scheme which his countrymen might not ...

A Final Word in an Introduction Section

- ▶ Alfred Edersheim *The Life and Times of Jesus the Messiah*
<http://www.holybooks.com/wp-content/uploads/The-Life-and-Times-of-Jesus-the-Messiah.pdf>
 - A gigantesque work on the New Testament (1000 pages)
- ▶ And now I part from this book with thankfulness to Almighty God for sparing me to complete it, with lingering regret that the task is ended, but also with unfeigned diffidence. I have, indeed, sought to give my best and most earnest labour to it, and to write what I believed to be true, irrespective of party or received opinions. This, in such a book, was only sacred duty. But where study necessarily extended to so many, and sometimes new, departments, I cannot hope always to carry the reader with me, or, which is far more serious - to have escaped all error. My deepest and most earnest prayer is that He, in Whose Service I have desired to write this book, would graciously accept the humble service - forgive what is mistaken and bless what is true. And if anything personal may intrude into these concluding lines, I would fain also designate what I have written as *Apologia pro vita mea* (alike in its fundamental direction and even ecclesiastically) - if, indeed, that may be called an *Apologia* which is the confession of this inmost conviction of mind and heart: 'Lord, to Whom shall we go? The words of eternal life hast Thou! And we have believed and know that Thou art the Holy One of God.'
- ▶ ALFRED EDERSHEIM, 8 BRADMORE ROAD, OXFORD: September 1883

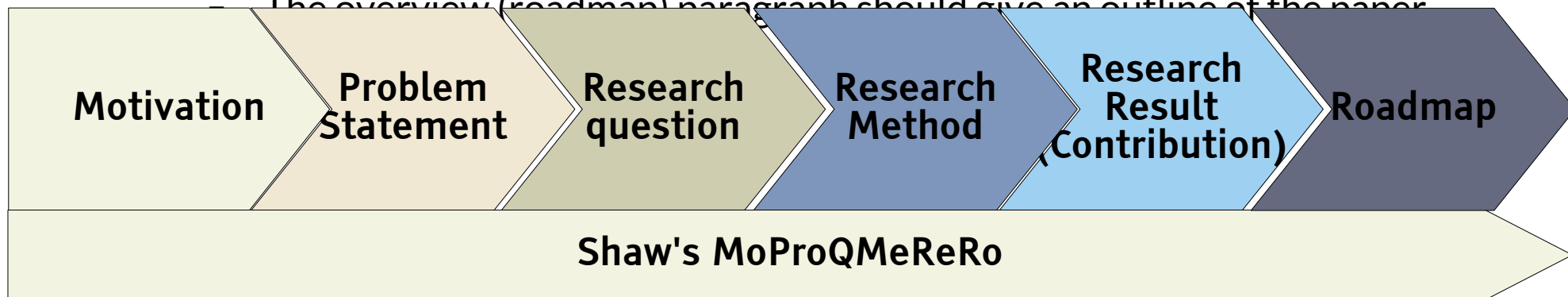
55.3 Introduction Sections of Papers



Paragraph Structure of an Introduction Section

- ▶ Introductory sections can be regarded as more detailed *template abstracts*
 - All template abstracts from Chapter “Research Methods” can be used, such as EnhancedModel, EnhancedSolution, EnhancedTool, RadicalSolution
- ▶ **Shaw's MoProQMeReRo pattern for Introduction sections**
 - [<http://spoke.compose.cs.cmu.edu/write/t/d/std-otl.htm>]
 - Motivation (background, trends, obstacle)
 - Problem definition
 - Core paragraphs: (see “template abstracts”)
 - Research question paragraph
 - Research method paragraph
 - Research Result (Contribution) paragraph: What does the paper deliver?

- The overview (roadmap) paragraph should give an outline of the paper



Great Section Controller in the Introductory Paragraph of a Section, with Funnel Introduction

[Dalton] THE BACK STROKE

It may seem odd to the beginner (and to a great many proficient swimmers, for that matter) that in teaching swimming by the Dalton system, I always begin by having pupils swim first on the back. Most instructors do just the reverse; but during nineteen years of a successful career in teaching, the proficiency of the graduated pupil has justified the method. **There are a number of very good reasons why learners should begin by first swimming on the back.** More especially is this true of nervous or timid pupils.

In the first place, the body floats more naturally and much easier on the back. In the breast stroke, which is the first one taught by most instructors, the head has to be kept out of the water and must be supported as dead weight by the rest of the body, as explained later on. On the contrary, in the back stroke, or swimming on the back, the head rests on the water and needs no support from any other member of the body.

For the same reason the face, being up and away from the water, the beginner encounters no difficulty in breathing, and there is no danger of the water entering the mouth, which is often the cause of much annoyance to new pupils.

Then, again, while on the back, as the face is turned upward, the beginner, especially in the case of a nervous person, gains confidence from the very fact that he is not constantly looking into the water. And also, in contradistinction to all other strokes in swimming, the arms and legs move together--both arms and legs performing practically the same movements at the same time.

Thus the pupil, realizing the comparative easiness and the absence of any difficulty in, having mastered this stroke, is imbued with such confidence that it becomes simply a matter of time and practise to acquire all other forms of swimming that he may wish to learn.

- ▶ Pyramid-based introduction (two levels of detail)
 - Abstract paragraph: one paragraph to overview all, e.g., with MOPARC or PIBA
 - Then, second level of detail: a “normal” MoProQMeReRo sequence
 - The body of the paper forms the third level

55.3.2 Contribution Paragraphs (for Research Results)



Contributions Paragraph

- ▶ For the first time, this paper introduces a technique...
- ▶ Feature2Goal paragraph
- ▶ SuccessProof paragraph showing the achievement of success criteria by solutions

55.3.2 Introduction Chapters of Theses

- ▶ for Bachelor, Master's, and PhD Theses



The Pyramid Principle

- ▶ Introductory chapters should follow the pyramid principle:
 - the top level gives a summary of the thesis on one page (for orientation and deciding whether to read)
 - the usage level should give a good understanding of the problem, research question, method, results and contributions
 - the technical level
- ▶ The roadmap section should give an outline of the thesis

55.3.3 Roadmap Paragraphs



Roadmap Paragraphs

- ▶ Roadmap paragraphs overview the structure of the following text.
- ▶ They are found
 - At the end of the introduction of a paper
 - At the end of an introductory chapter, often together with a roadmap figure
- ▶ Be aware, they can be boring, because they should contain a sentence introducing every section or chapter of the work.
 - Vary the sentence structure to make it readable

55.3.4 Thesis Paragraphs



Thesis Paragraph

- ▶ The Thesis Paragraph of an essay, a section, or a book presents the thesis
 - It is a special introductory paragraph for a larger block.
 - It is often a *suspended* or *funnel* paragraph with the thesis of the block in the end of the paragraph

Often, introductory paragraphs are suspended paragraphs, i.e., contain the thesis of section/book at their end

55.4. Definitions in Sentences and Paragraphs

- ▶ Definitions can make up sentences or whole paragraphs.



Definitions are Very Important

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Academic Skills in Computer Science (ASICS)

- ▶ Unclear definitions lead to misunderstandings, debates, quarrels, failed projects
- ▶ Clear definitions simplify comprehension
- ▶ Terms can be arranged in **taxonomies (Begriffshierarchien)**

- ▶ [Mills-Logic] John Stuart Mills. A System of Logic. eBooks@Adelaide. The University of Adelaide Library
- ▶ **The definition of a name, according to this view of it, is the sum total of all the essential propositions which can be framed with that name for their subject.** All propositions the truth of which is implied in the name, all those which we are made aware of by merely hearing the name, are included in the definition, if complete, and may be evolved from it without the aid of any other premises; whether the definition expresses them in two or three words, or in a larger number. It is, therefore, not without reason that Condillac and other writers have affirmed **a definition to be an analysis** . **To resolve any complex whole into the elements of which it is compounded, is the meaning of analysis:** and this we do when **we replace one word which connotes a set of attributes collectively, by two or more which connote the same attributes singly, or in smaller groups.**

Definition – What is That?

- ▶ Definitions according to Bünting (Schreiben im Studium, Cornelsen)
- ▶ An **ostensive definition** (hinweisend) defines with a picture
- ▶ A **real definition** describes the reality of a thing
- ▶ A **mereological definition** enumerates the parts of a whole thing
- ▶ A **class definition** defines the differences of a set of objects to another set of objects (differentiae), as well as a containing superset of objects (genus)
- ▶ A **nominal definition** explains the name of a thing or the parts of a name
- ▶ An **extensional definition** enumerates the elements of a set
- ▶ An **intensional definition** defines a set by enumeration of features or rules (see logic programming)
- ▶ An **operational definition** defines a process or a sequence of instructions

Operational Definition

- ▶ Anonymous. Steam Engines. Machinery's Reference Series, Number 70. Gutenberg.org eBook #34701
- ▶ A **steam engine** is a device by means of which heat is transformed into work. **Work** may be defined as the result produced by a force acting through space, and is commonly measured in foot-pounds; a foot-pound represents the work done in raising 1 pound 1 foot in height. The rate of doing work is called **power**. It has been found by experiment that there is a definite relation between heat and work, in the ratio of 1 thermal unit to 778 foot-pounds of work. The number 778 is commonly called the heat equivalent of work or the mechanical equivalent of heat.

Extensional Definition

- ▶ [Devlin-Writing]
- ▶ A **sentence** is an assemblage of words so arranged as to convey a determinate sense or meaning, in other words, to express a complete thought or idea. No matter how short, it must contain one finite verb and a subject or agent to direct the action of the verb.
- ▶ "Birds fly;" "Fish swim;" "Men walk;"—are sentences.
- ▶ A sentence always contains two parts, something spoken about and something said about it.

Mereological Definition

- ▶ [Devlin-Writing]
- ▶ The **simple sentence** expresses a single thought and consists of one subject and one predicate, as, "Man is mortal."
- ▶ A **compound sentence** consists of two or more simple sentences of equal importance the parts of which are either expressed or understood, as, "The men work in the fields and the women work in the household," or "The men work in the fields and the women in the household" or "The men and women work in the fields and in the household."
- ▶ A **complex sentence** consists of two or more simple sentences so combined that one depends on the other to complete its meaning; as; "When he returns, I shall go on my vacation." Here the words, "when he returns" are dependent on the rest of the sentence for their meaning.

- ▶ A **class definition (genus, Gattungsdefinition)** relates a set of objects to a more general class of objects (superclass, genus proximum) and distinguishes the class from neighbored classes by differencing features (differentia specifica) [Pellegrino, Bünning]
- ▶ “A cellular phone is a <genus>wireless phone</> that <differentiae>allows people to take it with them and phone everywhere</>.”
- ▶ [Devlin-Writing] There are three kinds of sentences, *simple*, *compound* and *complex*.
- ▶ There are two great classes of sentences according to the general principles upon which they are founded. These are termed the **loose** and the **periodic**.

Exercise Unit

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Academic Skills in Computer Science (ASICS)

- ▶ Define the term “Skat” by
 - class definition
 - nominal definition
 - real definition
 - Extensional
 - Intensional
 - Operational

Definition of Term

- ▶ [Stresemann]
- ▶ _Begriff_. Der Bierverlag als besondere Form des Flaschenbiergeschäfts stellt, wie aus den vorhergehenden Äusserungen erhellt, ein Unternehmen dar, welches von einer oder mehreren Brauereien Bier in Fässern bezieht, es _bis zur_ Genussreife lagern lässt und an Geschäfte, die sich mit dem Ausschank oder Einzelverkauf von Flaschenbier befassen, sowie an Privatleute in grösseren und kleineren Quantitäten abgibt, wobei als Minimum gewöhnlich die Entnahme von 10-20 Flaschen gefordert wird. Es ist nötig, auf diese Minimalgrenze hinzuweisen, denn sonst würden wir jeden Kleinhandel mit Flaschenbier, sofern nur der betr. Händler das Bier vom Brauer in Fässern bezieht als »Bierverlag« ansprechen müssen.
- ▶ Für einen kleinen Teil der Berliner Bierverleger würde die obige Definition noch in einer Hinsicht zu erweitern sein, indem dieselben von der durch die Brauereien eingeführten Lieferung des Berliner Weissbieres in demjenigen Zustande, welcher nur noch mehrtägiges Lagern verlangt, um in Genussreife überzugehen, keinen Gebrauch machen, sondern die letzte Nachgärung noch in ihrem eigenen Keller sich vollziehen lassen. Ihre Thätigkeit bei der Bierbereitung geht also in diesem Falle über das »Lagern bis zur Genussreife« hinaus, bewirkt allerdings andererseits keine Formveränderung von Rohstoffen, sodass von »Gewerbe« im nationalökonomischen Sinne auch bei ihnen nicht gesprochen werden kann.

Mathematical Definitions

57 Academic Skills in Computer Science (ASICS)

- ▶ Read the DFD-PN paper from Kavi

55.5. Discussion Paragraphs

- The “discussion” is an answer to the form of the research hypotheses
- Use dialective and pivotal development



Discussion Section

- ▶ Apart from the validation part, a paper needs to have a **discussion part**
- ▶ The **Discussion Section** of an essay or paper discusses **whether** and **how far** the solution solves the problem
 - It discusses the **fulfillment** of the success criteria and requirements.
 - It discusses **limits** of the solution
 - **Qualitative Discussion** presents pro and con-arguments
 - **Quantitative Discussion** presents multi-criteria analysis (e.g., with histograms, comparative measurements or kiviatic graphs)
- ▶ **Instruments:** PMIQ Perspectives Canvas, Qualitative comparative analysis tables
- ▶ The discussion part needs to emphasize several **internal** aspects discussed before: (dialective development)
 - **Advantages and Benefits**
 - **Disadvantages and Costs**
 - **Limits** (real limits, scope and assumptions)
 - **Open questions**
 - The discussion of the internal aspects is guided by the research hypotheses

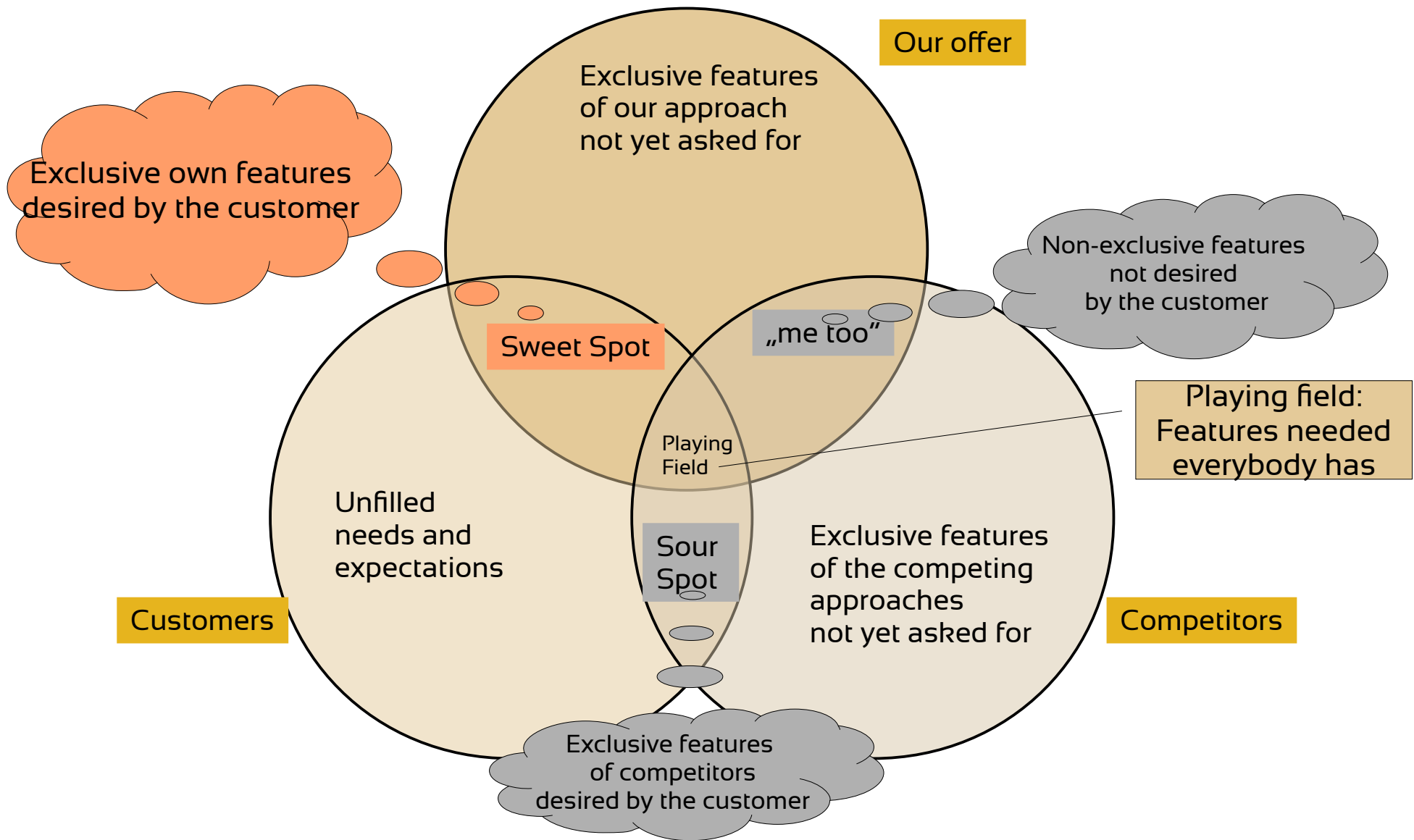
“Comparison to Related Work” Treats External Aspects

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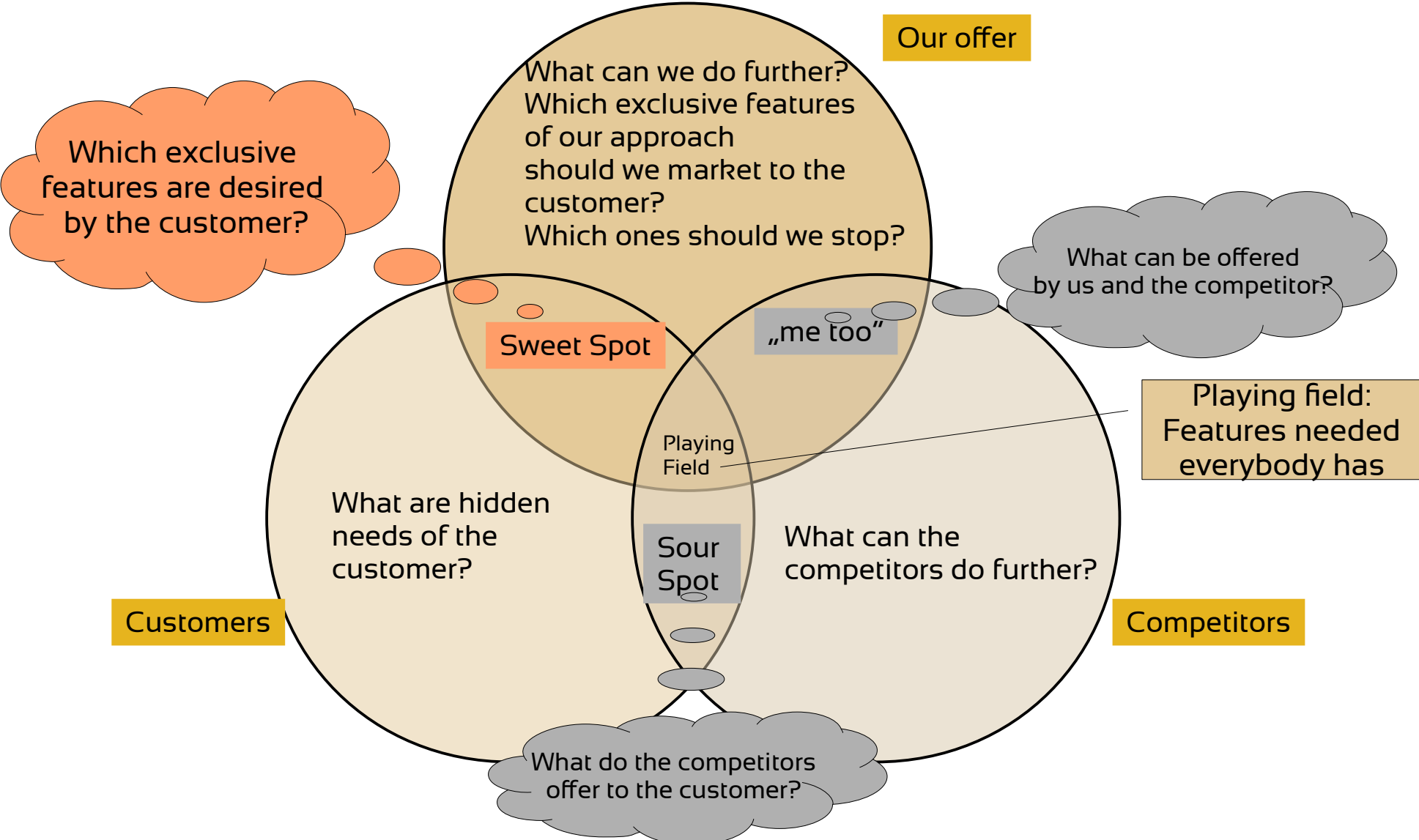
- ▶ Also **external aspects** should be covered (subsection “Comparison to Related Work”)
 - **Unique selling points** other research results do not have
 - Where other solutions have unique points, and what is the tradeoff
 - **Key performance indicators (metrics)** and how they could be improved
- ▶ **Instruments:** nABC, SweetSpot Canvas

Sweet Spot Canvas

- ▶ [SweetSpot] classifies the features of an approach with regard to the perspectives of our offer, the competitors, and the customers.



Guiding Questions (Leitfragen) in the Sweet Spot Canvas



Discussion with Counterarguments Against an Idea

- ▶ [VannevarBush]
- ▶ Two centuries ago Leibnitz invented a calculating machine which embodied most of the essential features of recent keyboard devices, but it could not then come into use. The economics of the situation were against it: the labor involved in constructing it, before the days of mass production, exceeded the labor to be saved by its use, since all it could accomplish could be duplicated by sufficient use of pencil and paper. Moreover, it would have been subject to frequent breakdown, so that it could not have been depended upon; for at that time and long after, complexity and unreliability were synonymous.
- ▶ Babbage, even with remarkably generous support for his time, could not produce his great arithmetical machine. His idea was sound enough, but construction and maintenance costs were then too heavy. Had a Pharaoh been given detailed and explicit designs of an automobile, and had he understood them completely, it would have taxed the resources of his kingdom to have fashioned the thousands of parts for a single car, and that car would have broken down on the first trip to Giza.

Discussion with Doubting Pivot Paragraph with Point-Last

- ▶ [Bernstein]
- ▶ Hier bricht das Manuskript zum dritten Bande ab. Marx ist leider nicht über die ersten Sätze des für seine Theorie so wichtigen Kapitels hinausgekommen. **Es mag dahingestellt bleiben, warum er gerade an ihm so wenig gearbeitet hat.** Wir können nur so viel sagen, daß selbst wenn er dazu gekommen wäre, es zu vollenden, es für heute doch unzureichend sein würde. Denn seit der Zeit, wo Marx das Zitierte geschrieben hat -- seine letzten Arbeiten am dritten Bande datieren vom Anfang der siebziger Jahre --, hat die Entwicklung so vieles an der sozialen Schichtung geändert, so viele neue Erscheinungen gezeitigt, daß das Bild, das er zu jener Zeit geben konnte, doch heute unvollständig und vielfach sogar unrichtig sein würde. Was z. B. bei ihm in der Wertung noch vollständig vernachlässigt wird, ist die Frage des technischen und kaufmännischen Personals in der Volkswirtschaft. Wir wissen, welche bedeutende Zunahme diese Klasse seit dem Tode von Marx erfahren hat.

Concessive Paragraph

- ▶ [Bernstein]
- ▶ **Allerdings** blieben sie (die Gewerkschaften) längere Zeit auf mäßige Mitgliederzahlen beschränkt und blieben daher in bezug auf die Erfolge ihrer Kämpfe noch völlig **abhängig** von den Konjunkturen des Marktes. Bei steigender Konjunktur erzielten sie Verbesserungen für die Arbeiter, die aber sofort wieder verloren gingen, wenn eine Geschäftsstockung eintrat. Die Lohnkurve bewegt sich einfach im Zickzack, ein Zustand, bei dem die Arbeiterklasse sich weder materiell verbessert, noch ihren Anteil an der Kultur hebt. Aber die Bewegung bleibt und sucht nun nach möglichst zweckmäßigen Formen, wie das seinerzeit auch in England geschah. Es spielen sich innere Kämpfe darüber ab, wie die Organisationen aufgebaut werden sollen, ob mehr zentralisiert oder mehr föderalistisch, beziehungsweise lokalistisch, ob die Gewerkschaft verknüpft werden soll mit Unterstützungseinrichtungen, oder ob sie eine reine Klassenkampforganisation sein soll. Der Streit darüber spielt lange Zeit in der Arbeiterbewegung und löst zeitweilig starke Leidenschaften aus. Es geht bei ihm manchmal nicht minder heftig zu als heute, und mitunter fehlt auch nicht Gewalttätigkeit.

Controversial Thesis Paragraph (Dialectic)

- ▶ [Bernstein]
- ▶ Um die Frage, ob Gewerkschaften zweckmäßig seien oder nicht, haben damals und noch später große Kämpfe im sozialistischen Lager sich abgespielt. Es gab unter den Sozialisten sehr ernsthafte Gegner der Gewerkschaften überhaupt.
 - In erster Reihe waren es die Utopisten, Leute, die in der Phantasie oder Spekulation ganze Pläne einer neuen Gesellschaft ausgearbeitet hatten und nur an deren Verwirklichung dachten. Für sie war der Klassenkampf der Gewerkschaften ein störendes Moment, außerdem waren die Objekte der Gewerkschaftskämpfe in ihren Augen Kleinigkeiten, die gegenüber dem Streben für die Idealgesellschaft nicht in Betracht kamen. So stellten sie sich den Gewerkschaften ablehnend gegenüber.
 - Gewerkschaftsgegner waren auch die radikalen Sozialrevolutionäre, die man am besten als Blanquisten bezeichnet, und deren Bewegung in Frankreich zu Hause war. Es gab ebenso in England bei den Chartisten eine Richtung, welche auf den Umsturz durch die Revolution abzielte und der daher die Bewegung der Gewerkschaften gleichfalls störend war. Das heißt, Kämpfe der Arbeiter um Lohnerhöhungen waren ihnen nicht unangenehm, die haben sie gelegentlich selbst provoziert, um dadurch revolutionäre Erhebungen zu erzielen; um so weniger wollten sie dagegen von der langsamen systematischen Gewerkschaftsarbeit wissen und standen mit den fest konsolidierten Gewerkschaften meist in heftiger Fehde.

55.6. Conclusion Paragraphs



Conclusion Paragraph

- ▶ The Conclusion Paragraph of a paper, an essay, a section, or a book presents
 - A rephrased thesis
 - The benefit of the paper
 - Closing a gap, advance
 - A message (step forward)

Conclusion Paragraph with Metaphor

[VannevarBush]

Presumably man's spirit should be elevated if he can better review his shady past and analyze more completely and objectively his present problems. He has built a civilization so complex that he needs to mechanize his record more fully if he is to push his experiment to its logical conclusion and not merely become bogged down part way there by overtaxing his limited memory. His excursion may be more enjoyable if he can reacquire the privilege of forgetting the manifold things he does not need to have immediately at hand, with some assurance that he can find them again if they prove important.

The applications of science **have built man a well-supplied house, and are teaching him to live healthily therein.** They have enabled him to throw masses of people against another with cruel weapons. They may yet allow him truly to encompass the great record and to grow in the wisdom of race experience. He may perish in conflict before he learns to wield that record for his true good. Yet, in the application of science to the needs and desires of man, it would seem to be a singularly unfortunate stage at which to terminate the process, or to lose hope as to the outcome.

Emphatic Last Paragraph of a Chapter

- ▶ Abbot-submarines
- ▶
- ▶ Aircraft and submarines! Twin terrors of the world's greatest war! The development, though by no means the final development, of dreams that men of many nations have dreamed throughout the centuries! They are two of the outstanding features of the war; two of its legacies to mankind. How much the legacy may be worth in peaceful times is yet to be determined. The airplane and the dirigible at any rate seem already to promise useful service to peaceful man. Already the flier is almost as common a spectacle in certain sections of our country as the automobile was fifteen years ago. The submarine, for economic reasons, promises less for the future in the way of peaceful service, notwithstanding the exploits of the *_Deutschland_* in the ocean-carrying trade. **But perhaps it too will find its place in industry when awakened man shall be willing to spend as much treasure, as much genius, as much intelligent effort, and as much heroic self-sacrifice in organizing for the social good as in the last four years he has expended in its destruction.**

Transition Paragraphs between Chapters or Sections

[Stresemann]

Die vorhergegangenen Betrachtungen umfassten die Entstehung und Entwicklung des Berliner Flaschenbiergeschäfts bis zum gegenwärtigen Zeitpunkt. Die Ausführungen mussten sich dabei auf allgemein Gesichtspunkte beschränken und konnten die geschilderte Entwicklung nur in grossen Zügen geben. Zu ihrer Vervollständigung soll daher die nachfolgende Darstellung dienen, welche im Rahmen der Detailschilderung die gegenwärtige Lage des Berliner Bierverlegerstandes im besonderen schildern will, als desjenigen Gliedes im Berliner Flaschenbiergeschäft, dessen Entwicklung eine typische Bedeutung beanspruchen kann, welche über das Interesse an dem vorliegenden Einzelfall hinausgeht. Gleichzeitig wird diese Einzelschilderung aber auch Rückschlüsse auf die Ausführungen des ersten Teiles dieser Arbeit gestatten und zur Bestätigung der darin ausgesprochenen Behauptungen dienen.

Last, Summary Paragraph using Concession

- ▶ [Bernstein]
- ▶ Alle diese Bewegungen sind Formen des Klassenkampfes der Arbeiter in der kapitalistischen Gesellschaft. Zusammen bilden sie einen organisierten Kampf, der jeweilig wenig revolutionär erscheint und in seinen Äußerungen durchaus nicht immer die traditionellen Formen von wirtschaftlichen oder politischen Kämpfen annimmt, der aber in sich die Möglichkeit trägt einer wahrhaft sozialen Befreiung der Arbeiterklasse.

The End

- ▶ Explain funnel introductions.