

Contributions to Management Science

Renata Petrevska Nechkoska

Tactical Management in Complexity

Managerial and Informational Aspects



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Contributions to Management Science

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Tactical Management in Complexity

Managerial and Informational Aspects

Renata Petrevska Nechkoska
Faculty of Economics
University St. Kliment Ohridski
Bitola, North Macedonia

Faculty of Economics and Business Administration
Ghent University
Ghent, Belgium

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*This book is dedicated to my family,
To my parents, Vesela and Dragi Petrevski,
And to my beautiful daughter, Noela.
Wholeheartedly, with love and endless
gratitude and in awe,
Yours,
Renata*

Foreword

Renata Petrevska Nechkoska has a prodigious talent for finding, assimilating and building knowledge from an almost alarmingly broad spectrum of disciplines and sources. She consistently and successfully integrates her learnings from these into original and important contributions to managerial theory and practice.

This work is an exceptional document by a formidable talent, and I am fortunate to have her as an S&R carrier and extender in both the academic and business worlds. Publishing it for an international audience is a logical next step.

This book is a product of research about helping individual managers accomplish their purpose(s). It was inspired through practice (both from researcher's own experience and by interviewing professionals), where middle managers face tremendous challenges and need tailored support on the socio-technical nature of people, resources and problems they face. With this motivation, the author provides overarching managerial guidance and personalized information system structure throughout time. The Design Science Research methodology enables relevant, rigorous and applicable research that results with an artifact implementable enough to be applied in a variety of environments and generic enough to contribute to the knowledge base of management and management information systems.

Renata Petrevska Nechkoska contacted me early in her PhD dissertation process to learn about S&R from its source. This is a framework she used—among others—that fit her objective of addressing tactical management issues in times of complexity and unpredictability. After numerous coaching sessions, discussions, challenges and reflections we shared in the virtual space, I can attest to her qualifications to teach and apply the concepts and prescriptions of adaptive enterprise and sense and respond. She has made original and significant contributions to the application of sense and respond at tactical levels. I consider her level of understanding of sense and respond to be at the expert level.

The DENICA method, based on the sense and respond framework, guides the person on what to think, consider, observe, configure and reconfigure in order to reach goals in unpredictable and changeable environment. In its essence, this means incorporating adaptability at the core of tactical management—in both managerial and information system contexts. In companies, this translates into guidance for the

managers on tactics—how to effectively manage what is given towards what is expected in dynamic context. In private life, this translates into a rigorous framework for what we must pay attention to and how we should reason and act in pursuing our individual and collective purpose(s).

Sense-and-Respond Managerial
Framework: Designing and Governing
Adaptive Organisations Adaptive
Business Designs, Pound Ridge,
NY, USA

Stephan H. Haeckel

Acknowledgement

From time to time, there comes a chance to give an official written acknowledgement to persons to whom you would prefer to shout ‘Thank you for all your help and everything you have done for me!’ But, I have to clarify that saying the words of thankfulness is just a drop in the ocean. To the ones who have been my partners in this journey, I would like to say, show and sustain my most sincere gratitude in words and deeds in present and future times, for which I hope I will have a chance in life. It has been a turbulent road of sensemaking, hard work, finding and losing yourself so many times and bitter-sweet conquering of hills just to find abundance of new valleys and elevations before the mountain. No one can do it alone, without being taken care of by partners (even someone like me, confident in reading the stars of strategy and tactics, effectuating once in a lifetime opportunities and enjoying work and brain pain). It is a beautiful thing when a career and a passion come together—I am pursuing that through the personal examples of the people I worked with.

Just like the genesis of this work, I would like to start with my PhD mentors—I have the two most one-of-a-kind mentors in the world: Prof. Dr. Gjorgji Manceski, who facilitated my migration to the Academe, to complete me as a practitioner and researcher, and supported all my big and small, regular and special endeavours within this project, and Prof. Dr. Geert Poels, who facilitated my international research horizons and supported all the specific personality traits and ideas in remarkably delicate, individualized and purposeful manner. I am obliged with the time, effort and energy my mentors invested in me. They have given me roots and wings, both of them acting with utmost professionalism and true heart and enabling me, their student and friend think and feel once again that the sky is the limit.

To continue with the ones who have given me guidance, I would like to thank Stephan H. Haeckel, who has coached me in proper use of his sense-and-respond framework. It served in many directions—I could originally understand and apply it and, furthermore, shape and enhance it for tactical management. The endless Skype sessions with Steve have been of primary importance for this work to have clarity and no hesitation when facing the real world.

I would like to thank my Prof. Dr. Ljupco Pecijareski, for all the support and mutual understanding we have achieved, in our pursuit for the perfect collaboration.

To my PhD jury members and this book's reviewers, I extend my sincere thank you for the priceless viewpoints, constructive criticism and richness of feedback I have received. The knowledge and the both strong and subtle manner of transferring to me, improving the work and broadening the prospects that I received from each of them are remarkable—Prof. Dr. Patrick Van Kenhove, Dean, Prof. Dr. Frederik Gailly and Prof. Dr. Ir. Jan Devos, Ghent University, Belgium; Prof. Dr. Jelena Zdravkovic, Stockholm University, Sweden; University Prof. Mag. Dr. Walter Schwaiger, Vienna University of Technology, Austria; Prof. Dr. Marjan Angeleski, Prof. Dr. Marika Baseska-Gjorgjieska, Prof. Dr. Snezana Mojsovska Salamovska and Prof. Dr. Pece Mitrevski, University St. Kliment Ohridski, Republic of North Macedonia; and Prof. Dr. Bekim Fetaji, University Mother Teresa, Republic of North Macedonia.

To my colleagues at UGent, Belgium, and UKLO, North Macedonia, I would like to thank the tolerance and calmness in hard times and cheers in good ones. To my students, I would like to thank the endless energy and inspiration their youth brings along, their attempts to uptake and improve the components of this research and for giving me the honour of being part of the construction of their future.

I thank my true friends whose reasoning and life wisdom have cleared any doubt that you can pursue your dreams and sometimes succeed—and that I can rely on their support in need.

With highest respect, I thank Marc van Aerde, Christophe Catry, Borché Stojanovski, Sasho Naumovski, Bertrand Andries, Charlotte Vanrobaeys, Natasja Ramakers, Filip Bossuyt, Zharko Kachakov and all the business collaborators (heads of departments and divisions, CEOs, project managers, SME owners, assistants) who opened their companies' doors to my research from beginning and with no end and who have interweaved in this work their expertise, advice, collaboration and friendship with remarkable ease and professionalism. Marc has been my open, cheerful and always supportive collaborator and friend since the very first interview and has remained such, hopefully in the future. We have added idea on top of idea with remarkable compatibility and mutual understanding; it is amazing how diverse managerial grasp he had as well as sense for my academic and research challenges, just to be there to help. It is special when lasting friendship and support results from professional collaboration. On the side of the 'school of practice', I would like to mention the role my almost a decade-long international financial institution experience had in proper positioning of the research goals and shaping of the solution. Being mostly on the middle management positions in ProCredit Bank (head of Human Resources, branch manager, project coordinator, etc.) in diverse domains and with exponential learning curve, the practitioner insights and orientation became precious for the future researcher.

I owe special gratitude to the European Commission for the Basileus PhD exchange scholarship that made the double degree possible and for the another priceless experience they have given me through the relation as evaluator for Horizon2020 projects with ICT disruptive innovation core—a role I find unique and important for anyone bridging academia and business; to the UGent and UKLO

rectorates, FEB decanates and International Relations Departments who enabled prospects and ensured smooth flow of all activities in their power, so that this research becomes a reality; and to the Springer team whose professionalism and kindness make anything possible, bridging distances, cultures, intellects and improvements, Christian Rauscher, Philipp Baun, Irene Barrios-Kezic and Ralf Gerstner. The author would like to thank Mr. Abdus Salam, project coordinator (Springer Nature), and Ms. Krithika Shivakumar, project manager, for their support in the production of this book. It was a journey of collaboration in which one feels the added value is in the outcome of the project but also even more in the selfless support to enable everyone's growth and satisfaction. Sincere thanks to Nikola Sikijovski for assisting me with the images of arm and shoal of fish. Thanks to Ian Copestake for the professional proofreading services.

Finally, the most heart-warming reason for my challenges and strive to improve this world—my beautiful family and my beloved parents who have taught me self-sacrifice, honesty and hard work, along with cosmopolitanism and tolerance, in whose arms everything is possible for me. My mother's and father's selflessness and devotion to me and my family are something I will try to amplify through my being and my heritage. I live in awe every precious moment with my daughter, Noela, whose early childhood paralleled a condensed double PhD degree with all its ups and downs and because of whom I am giving my best in life with hope to incept better future for our children. Her precious existence gives me strength to fight many battlefields, and looking with love in her eyes makes me recharge for many more.

Living and working in this moment in time, in a global village still unsettled among its members and within its natural environment, are in the very least intriguing. I have been privileged with the support of the right people and awesome circumstances to carry out something fulfilling and make a positive difference. My gratitude keeps me humble and challenged.

Faculty of Economics
University St. Kliment Ohridski
Bitola, North Macedonia

Renata Petrevska Nechkoska

Faculty of Economics and Business
Administration
Ghent University
Ghent, Belgium
February 2019

About the Book

This book contains research about helping the individual manage towards the accomplishment of purpose(s). It is inspired in practice (both from researcher's own experience and by interviewing and collaborating with professionals), where **managers in the middle** are facing tremendous challenges and need tailored support on the socio-technical nature of people, resources and problems they are dealing with. With this motivation, the researcher aims to contemplate overarching managerial guidance and personalized information system structure, throughout time. The **Design Science Research methodology as foundation for methodological kaleidoscope for Action Design Research, nested problem-solving and CIMO logic** has enabled making a relevant, rigorous and applicable research that results with an artifact which is implementable enough to be applied in the appropriate environment and generic enough to contribute to the knowledge base of management and management information systems, in the very least of its core.

The DENICA method for tactical management guides the person on what to think, consider, observe, configure and reconfigure in order to reach the goals in unpredictable and changeable environment, interrelated with others. This means tactical management and its **core characteristic—adaptability**—both in managerial and information system senses and both towards what is 'given' and what is initiated as desired change in order to improve towards a purpose. In companies, this translates into guidance for the managers on tactics—how to effectively manage with what is given towards what is expected in dynamic context. In private life, this translates into roadmap on what we need to pay attention to and how we should reason and act in pursuing our individual and collective purpose(s).

The artifact development has been carried out through the stages of Action Design Research in 4 companies with 11 managers in Belgium and North Macedonia. The knowledge and practical questions of the nested problem-solving guided the researchers throughout the project, and the CIMO logic provided the basis for the realist evaluation.

The research attempts to parallel the real world by being **multidisciplinary**—incorporating **management, information systems and complex adaptive systems** as subject being managed; **complexity theory** to describe the current context of

living and working; **social network analysis** as the manner to visualize, describe, communicate and get everyone on board around a purpose; and **sense and respond framework** for providing adaptability that properly responds to the unpredictable environment. This research sheds different light on the management information systems nature as perceived from the side of the manager as user and the nature of work (i.e. information flows) as dynamic, changeable and living matter.

Hopefully, *the DENICA managerial method* and *the tactical management research* (as part of management control) will *reintroduce the perception of tactics* as important managerial function that provides and necessitates adaptability and *uncovered source of competitive advantage and of its information system distinctive profile and needs*.

Please find additional materials, dynamic visualizations, practical implementations and further contact about tactical management in complexity and the author on: <http://tactical-management-in-complexity.com>

Faculty of Economics
University St. Kliment Ohridski
Bitola, North Macedonia

Renata Petrevska Nechkoska

Faculty of Economics and Business
Administration
Ghent University
Ghent, Belgium

Contents

1	Introduction to Tactical Management Research	1
1.1	Research Context: Starting Point: Tactical Management	2
1.1.1	Main Research Questions	9
1.2	Positioning of the Research	10
1.2.1	Strategic Managerial and Management Information System Support	10
1.2.2	Operational Managerial and Management Information System Support	11
1.2.3	Tactical Managerial and Management Information System Support	11
1.3	Research Methodology	13
1.3.1	Design Science Research	13
1.3.2	Action Design Research	16
1.3.3	Nested Problem Solving	18
1.3.4	CIMO Logic	18
1.4	The Methodological Kaleidoscope Through the Structure of the Book	21
	References	24
2	Problem Investigation and Solution Requirements for Tactical Management	27
2.1	Research Methodology for Problem Investigation and Solution Analysis	28
2.2	Problem Investigation	29
2.2.1	Interviews	32
2.2.2	Literature Review	40
2.2.3	Identifying Managerial Methods and Management Information Systems Support for Strategic, Tactical, and Operational Management	48
2.3	Defining Tactical Management	52

2.4	Delineating Tactical Management Among Operational, Strategic, and Project Management	53
2.5	Solution Requirements	57
	References	59
3	Theoretical Foundations: Management—Information Systems—Complexity	65
3.1	Particular Postulates On: What Is Being Managed, In Which Environment, and How to Address It	68
3.1.1	Complex Adaptive Systems (CAS)	68
3.1.2	The Edge of Chaos	71
3.1.3	Concepts of Adaptive and Adaptable and Incorporation of Purpose	71
3.1.4	Managing Sociotechnical Complex Adaptive Systems in Uncertainty	74
3.2	Tactical Management Postulates for Purposive Adaptability	81
3.2.1	System Design and System Thinking	83
3.2.2	Context Capture and Situation Awareness in Dynamic Systems	92
3.2.3	Effective Continuous Communication and Visualization	100
3.3	Management Information Systems Nature for Tactical Management	106
3.4	Sense-and-Respond Framework Toward Providing Managerial and Informational Adaptability for Tactics	110
3.4.1	Background and History	110
3.4.2	The Basics of the S&R Framework	111
3.4.3	Recommended Applicability of the S&R Framework	115
3.4.4	Sense and Respond Managerial Profile	116
3.4.5	Role-and-Accountability (R&A) System Diagram	117
3.4.6	Sense—Interpret—Decide—Act (SIDA) Loop: The Adaptive Loop	120
3.4.7	Management Information Flows in the S&R Framework	122
3.4.8	Sense and Respond Implementation Roadmap	122
3.5	Mapping Complex Adaptive Systems, Sense-and-Respond Framework, and Social Network Analysis	123
	References	126
4	Tactical Management Method Development and Evaluation	135
4.1	Action Design Research for Tactical Management Information Systems and Adaptability	138
4.1.1	Action Design Research as Method	138
4.1.2	Performing Action Design Research with Companies and Managers in Belgium and North Macedonia	140

4.2	Context(s): Description of the Business Collaborators in the ADR	145
4.2.1	Context 1: Company A, End-Users 1–9	145
4.2.2	Context 2: Company B, End-User 1	146
4.2.3	Context 3: Company C, End-User 10	147
4.2.4	Context 4: Company D, End-User 11	147
4.3	ADR Stages	147
4.3.1	ADR Stage 1: Problem Formulation	147
4.3.2	ADR Stage 2: Building—Intervention—Evaluation	149
4.3.3	ADR Stage 3: Reflection and Learning	188
4.3.4	ADR Stage 4: Formalization of Learning	196
	References	208
5	Tactical Management Contributions to Managerial, Informational, and Complexity Theory and Practice	213
5.1	Research Contributions	214
5.1.1	Contribution 1: The Artifact DENICA	215
5.1.2	Contribution 2: The Methodological Kaleidoscope	220
5.1.3	Contribution 3: Enhancing the Sense-and-Respond Framework for Tactical Management	222
5.1.4	Contribution 4: Tactical Management 2.0	223
5.1.5	Contribution 5: Interrelating Complex Adaptive Systems, Uncertainty, and Tactical Management	227
5.2	Implications for Research	229
5.3	Implications for Practice	231
5.4	Limitations and Future Prospects	233
	References	236
6	The Tactical Management Method “DENICA” in Practice: Business Cases	239
6.1	Description of the Problem Formulation (Problem Types, Contextual Factors, and Risks) for the Four Contexts	240
6.1.1	Existing Situation Improvement for Existing Organization: Context 1	240
6.1.2	New Project Support for New Organization: Context 2	242
6.1.3	New Project Support for Existing Organization: Context 3	243
6.1.4	Existing Project Support for Existing Organization: Context 4	244
6.2	The Building-Intervention-Evaluation Stage Elaborated for Each of the Four Contexts	246
6.2.1	Context 1	246
6.2.2	Context 2	254
6.2.3	Context 3	272
6.2.4	Context 4	276
	References	288

About the Author

Renata Petrevska Nechkoska is a researcher, lecturer and practitioner with considerable experience both in rising economies such as in Western Balkans and in Western Europe. After a decade of middle management experience in banking (being HR manager, branch manager, project coordinator, etc.), she moved to the academic world in order to approach tactical management from a multidisciplinary perspective. She holds double PhD degree in Business Economics from Ghent University, Ghent, Belgium, and PhD in Management from the University of St. Kliment Ohridski, Bitola, North Macedonia. In her role as a project evaluator for the European Commission, she applies strategic, tactical and operational management thriving in an unpredictable global environment in order to yield sustainable, context-appropriate business models and disruptive innovations. As head of research team in the Western Balkans Alumni Association (facilitated by the Directorate General for Education and Culture), she works with Western Balkans alumni towards improving the higher education in the region, the integration into the European Union, the brain circulation and the overall Western Balkans research and educational but also socio-economic context. As Ghent University Western Balkans ambassador, she disseminates the ‘Durf Denken’ or ‘Dare to Think’ mindset of cutting-edge research and education, win-win mentality and utmost professionalism from developed Europe to the Western Balkans. Under the guidance of Harvard’s Center for International Development, she led a team towards introducing a strategy for solving complex problems, such as improvement of the air quality in the region, iterating the project towards real outcomes. Her current ambition is to assemble a proper combination for complexity—strategy, tactics and operations—both in managerial and informational senses. She is fascinated by complexity science and complexity economics. Her passion in environment, circular economy, societal issues and overcoming challenges of developing countries is spread into diverse volunteering efforts, citizen movements and supportive affirmative actions. She believes that in order to properly address this complex, interrelated, information-rich world, we need multidisciplinary, multi-stakeholder, MultiCreation managerial approach—and she aims for real, visible, satisfactory outcomes, quick wins but also (and

especially) positive roadmaps that will fruit in the future. She commits restlessly and creatively her unique worldview to diverse range of domains and activities to facilitate coevolution among students, peers, academics, businesses, economies and disciplines. She is filled with gratitude to her mentors, supporters, friends and family and is challenged to make this world a better place for her child and all our future generations.

Chapter 1

Introduction to Tactical Management Research



The Denica method works! The amount of insight it provides is comprehensive, you can easily translate the method into real life actions, the awareness you can create with the method for higher management is game-changing, the amount of control you gain with the method is unexpectedly high, it forces you to think about working in a structured way. It provides you with a method that allows you to see visually what is influencing you. It also gives an insight in not only your own responsibilities but also of the people you are in contact with. The method combines several points of view into a 360° overview of the workspace you are functioning in.
Marc Van Aerde, Suelto GCV, Belgium

This research is motivated to show how tactical management needs adaptability, to elaborate why and how it can be addressed and to design a method that supports the manager in the adaptable facilitation of a system toward the accomplishment of desired outcomes. Our approach is comprehensive, embodying the managerial and informational aspects of a solution. Tactical management operates in dynamic and complex environment and faces numerous **givens** in a union of interrelated entities and actors in a certain direction. At the same time, it needs to initiate changes and enforce them in order to achieve improvement. The manager dealing with tactical management issues is not very well supported by guidance or solutions on how to manage in an adaptable manner that incorporates the overall big picture of entities, but that also provides the necessary information flows and enables the manager to be in a position to communicate managerial actions. This research aims to provide the person (the manager) with an artifact that supports managerial adaptability through system design, context capture, effective communication, and tactical management information system adaptability through self-designing information entities and flows.

This chapter outlines the research in brief.

- It starts by clarifying tactical management, intentionally contemporary redefining it and emphasizing its importance, concluding with the main research questions.

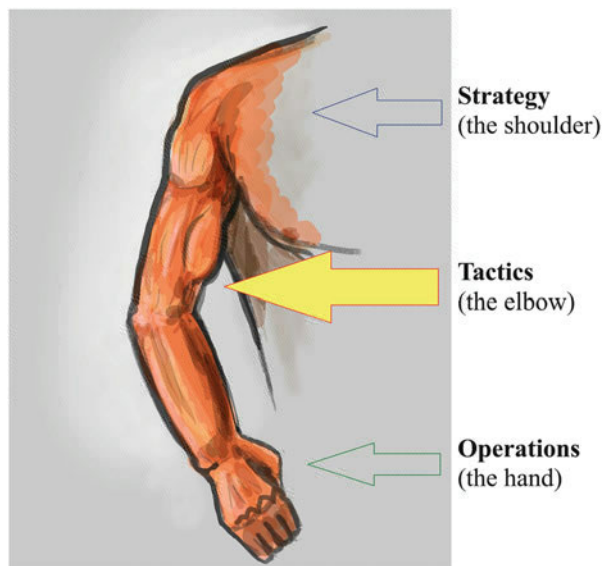
- Positioning tactical management in the domains of management and information systems—combining them with complexity theory.
- Presenting the methodology of Design Science Research, upon which foundations, Action Design Research, Nested Problem Solving, and CIMO logic have been built.
- Outlining the structure of the book.

1.1 Research Context: Starting Point: Tactical Management

Tactical management is a managerial function that aims to achieve given goals, with given resources, in given circumstances, with respect to given rules, preconditions, and strategic guidelines in a dynamic environment. All these **givens** are strikingly numerous and diverse and tactical management faces the necessity of (1) generating change and/or (2) adapting to change in order to accomplish a purpose, in a dynamic and unpredictable environment. The first very important *source of changes are the ones the manager* needs to initiate and effectuate in order to facilitate improvement and goal accomplishment. The second are the ones we can't influence. We here add the **dynamic** aspect because in time everything is subject to changes (resources, goals, context, environment, etc.)—so offering only a static view is insufficient. “Context” in this sense denotes the circumstances that form the setting for an event, statement, or idea, and in terms of which it can be fully understood (Oxford English Dictionary 2017b). The **unpredictability** is another very distinctive thread of thought that needs to be incorporated—situating and orienting oneself is very demanding when a system needs to exist and grow in a global information economy, where changes will occur but in unpredictable ways. The starting point of this research was the observation that tactical management is less well supported by information system solutions and managerial solutions than strategic management [as “the full set of commitments, decisions, and actions required for a firm to achieve strategic competitiveness and earn above-average returns” (Hitt et al. 2004) and as “the process of deciding on objectives of the organization, on changes in these objectives, on the resources used to attain these objectives, and on the policies that are to govern the acquisition, use, and disposition of these resources” (Anthony 1965)], and operational management [as the systematic design, direction, and control of processes that transform inputs into services and products for internal, as well as external customers (Krajewski et al. 2012)]. To specify the specific information needs of tactical managers, a clearer understanding of tactical management and how it differs from strategic and operational management is needed.

If we take for example the human body, where the brain creates, reasons, sets objectives, reacts to circumstances, etc. and transmits the information and action via the nerves and muscles, then we can focus on the arm. The arm's components can be perceived as follows: the shoulder—strategy, the hand—operations while the elbow

Fig. 1.1 Analogy of the human arm with strategy, tactics, and operations
(Source: Author)



resembles tactics—the one that provides flexibility and adaptability for the arm to do what it is supposed to do with the hand. Adaptability is perceived as the quality of being able to adjust to new conditions but also as the capacity to be modified for a new use or purpose (Oxford English Dictionary 2017a). In our analogy of strategy, tactics and operations, with the human arm—we could position the strategy in the shoulder because it is somewhat movable/changeable but also very much affixed by being attached to the body (organism, company) and a person can’t move the shoulder freely apart from it without moving the entire body or severing it. The hand is on the opposite end, denoting operations. If someone needs to grasp an object, lift something, push, pull, etc. it is the hand and fingers that are doing it. The shoulder and the hand are interconnected with bones, muscle tissue, nerves, veins and arteries—each of which have a specific function in the task of keeping the arm alive and functional. Employees, information systems, communication systems, equipment, knowledge, training and capabilities will find parallels in these highlighted components of the arm (Fig. 1.1).

However, when the arm needs to perform an action, it flexes, extends, rotates, stretches (Fig. 1.2) inspired by Da Vinci (1478), Wakelin (1912), Banbury (2017) at the elbow to adjust its positioning in all dimensions of space and time. If it needs to push a cart toward a finish line, it flexes, stretches, rotates mainly at the elbow, but also to some extent at the shoulder, in order to maintain course in a dynamic manner in time but also according to the road conditions. If there is a bump in the road, it will adjust height, strength of grasp, make a rotation and try to keep the object in hand. If it gets hurt at some place, it may not function properly or at all.

It is the capability for the utmost adaptability in space and time that is situated in the elbow—and analogously in tactics. If we try to engineer a robotic arm that performs the same functions as a natural human arm, it will either have to consist of exactly the

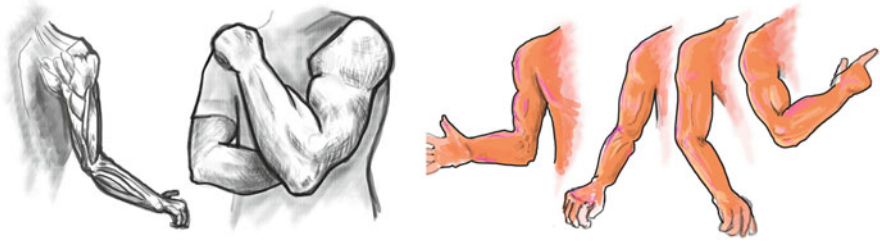


Fig. 1.2 Possible movements of an arm—flexion, extension, adduction, abduction, medial (internal) rotation, lateral (external) rotation, and circumduction provided by the adaptability of the elbow along with the shoulder (Source: Author)

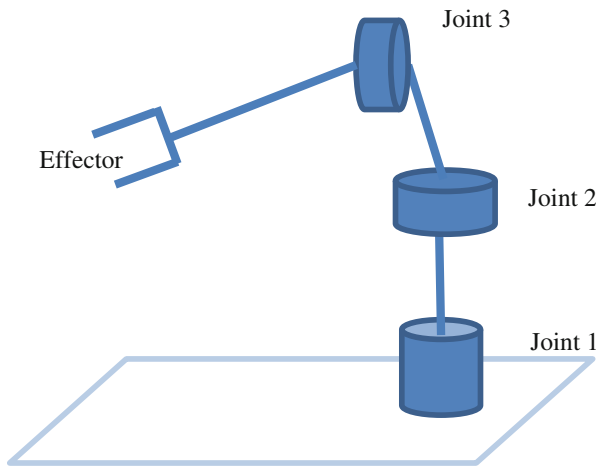


Fig. 1.3 Robotic arm (Serial manipulator) with components (Gan et al. 2012) (Source: Author)

same components—joints, connectors, wires for the information and power flows, appropriate materials; or something else will need to be engineered that will anyhow have a fixed end—the elbow connected to a body; a micro-adjustable component—mimicking the hand and fingers; and a rotating joint somewhere in the middle or in the body. The robotic arm (as a serial manipulator) presented on Fig. 1.3 has a base (resembling the body), joint 1 (resembling the shoulder), end-effector (resembling the hand), and joints 2 and 3 (resembling the elbow[s]). The organizations, the projects and the entire sociotechnical systems we are living and working in have many artificial elements in them—so we need to pay particular attention to how we are designing them in order to function purposefully and sustainably. We can't provide an exhaustive set of prescribed actions and movements, because we can't fully plan every future development and contextual change—but generic adaptability—with rounded joints, connections and communication networks and muscle tissue.

But if we observe the situation in real life today—for example middle managers or project managers with very little support to achieve adaptability and working only



Fig. 1.4 Robotic arm (serial manipulator) with body, shoulder and hand and no elbow in the middle—resembling current tactical management support with adaptability and information systems (Source: Author)

with an automatized information systems design that feeds abundant data with not much context-dependent and/or relevant structure; they are like a robotic arm that doesn't have an elbow. It has a limited maneuvering space and possibility of accomplishing purpose(s). The strategic information flows coming through the shoulder are connected directly to the sensors in the hand and fingers; which return data back through the shoulder and somehow omit the elbow (Fig. 1.4). What would the performance of that arm mean? If it is supposed to capture an object from a table—the body would have to be placed at a specific distance in order for the non-elbow arm to point and grasp it. If the table changes location, so should the entire body, because the arm is too rigid to reach a straight line point. The alteration of location of the aimed object is just one of the changes that happen in real life, which the body and arm should be adaptable to. Others come from altitude, weight, size, stability of the ground. An arm without an elbow would have a very limited set of actions that it can perform without involving the entire body. Such a serial manipulator is presented on Fig. 1.4. The maneuvering abilities of that robotic arm are limited—horizontal and vertical. If any change occurs, it will take radical changes (energy, costs, time, resources, etc.) to the entire arm and body to be able to respond appropriately. What we are witnessing nowadays in management and information systems is some sort of non-elbow arms—organizations, projects with a large strategic focus and abundant operational data with little or no “joints” in the middle. It is even more difficult in reality to move the entire body (the company) to react to even the slightest changes in the environment. For this reason, we should emphasize the adaptability of the elbow as a joint in order to provide as many potential alternatives for action as possible. We ought to do the same with tactical management—for which this research has been conducted and possible solutions and knowledge offered.

Since there is a prerequisite for tactical management to be adaptable to dynamic and unpredictable changes in each of the “givens” (strategy, goals and KPIs, processes, resources, competitors, economies, etc.)—as a consequence, the “tactical manager” (the manager dealing with tactics) needs to continuously scan and probe the **(internal and external) context, environment** in order to get the necessary and complete information for successful facilitation and steering toward an effect, the desired effect.

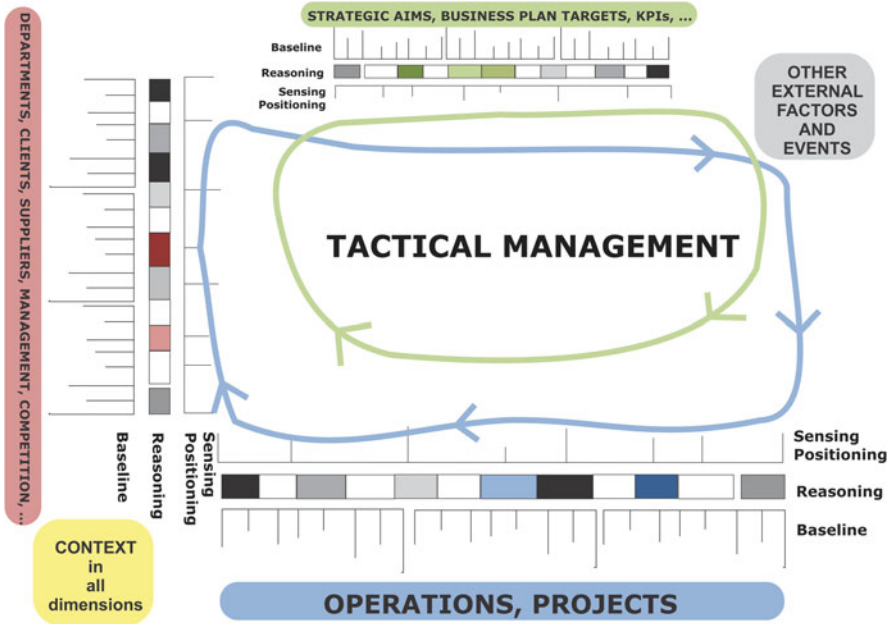


Fig. 1.5 Visualization of tactical management role and need for adaptability in the internal and external context (Source: Author)

Figure 1.5 clarifies our approach to this research. We are putting ourselves in the shoes of a tactical manager (predominantly a middle manager of a department, for example). There are numerous projects, events, developments that are occurring on a daily, weekly, monthly basis. Some are repetitive some occasional, some unique. Usually, the core business operations are covered by information systems, various software solutions, dashboards and clear, somewhat optimized and efficient business processes. The manager needs to have a moderate and diverse understanding of the operations he/she is managing (the baseline vertical lines at the bottom of the figure), their own reasoning of the interconnectivity, interrelatedness and interdependency among things (the rectangles shaded in blue, black, white, gray just above the vertical lines) and the positioning of his/her own information sensors (the open-ended vertical lines above the rectangles) regarding the current specific context and situation the manager, his department, organization and environment are in. For instance, if there is a new trainee taking over regular responsibility, the manager ought to position his/her information sensors to obtain more frequent, somewhat more detailed qualitative and quantitative information on how that trainee is doing, and what errors or need for training becomes evident, etc. until the induction is done properly; and then change the frequency of obtaining the information, possibly the details, and so on. On the opposite end—at the top of the figure, the same principle is applied when observing the strategic aims, business plan targets, KPIs, effects, goals. The manager in the middle should have knowledge of strategy [as an

integrated and coordinated set of commitments and actions designed to exploit core competencies and gain a competitive advantage (Hitt et al. 2004)] and the aims and goals expected to be achieved (the baseline vertical lines on the top of the figure), his/her own reasoning (the rectangles shaded in green, white, and gray) and positioning of their own information sensors depending on his/her own context. There are rather diverse managerial methods and information support for strategic management, ERP systems, scorecards, etc. Another group of entities and events that are less frequently taken into the primary consideration of the middle managers are the other departments, suppliers, competitors, clients, legislative, technology, etc. that also influence the outcomes of managerial efforts. For them also the middle manager should have a proper understanding (the baseline of horizontal lines far left on the figure), reasoning (the rectangles shaded in red, white, black, gray) and position their own information sensors depending on the current context. The information for these developments is rarely quantitative and contained in a software platform. Most of the times, this is qualitative information obtained by following news, forums, having phone conversations, attending business gatherings, etc. The rest of the events, entities and occurrences taking place in the world are presented on the figure by the element “other external factors and events.” The tactical manager’s duty is to position the information sensors according to his/her own reasoning, with respect to the prescribed principles, goals, and expectations from a strategic altitude. The manager should, furthermore, continuously scan and revise the information flows according to changes that happen in time in any of these elements. This behavior is shown by the two loops (blue and green) that surround tactical management in the middle of the figure. In other words, the manager should capture the context in all its dimensions, and make proper actions in response. As we can conclude from this elaboration, it is mostly all “givens” that are at the hand of the tactical manager: Resources, entities, expectations that are given and that he/she should find a way to accomplish what is expected by utilizing what is given, considering all the factors in the external and internal context. Sometimes the manager will need to adapt to the changes in the “givens” and even more frequently initiate changes—regardless, changes are the core component the manager needs to deal with. To return to the arm analogy, the “elbow” needs to make various continuous movements to maneuver it toward a successful ending. This maneuverability should be available to tactical management too, as it is not a plan that can fit in the middle and automatically converge strategy to operations and vice versa, when things are changing dynamically but adaptability—by interweaving different components in one way or another, and still facilitate a good result.

If we place the operations, projects, departments, competitors, legislative and other entities and events on one side, and strategic expectations on the other, we can see that the manager is faced with the most diverse and disconnected domains and areas of work (Fig. 1.6). These are presented on Fig. 1.6 by various polygons in different colors (shaded blue, green, and red). The current information system design provides some support for the manager—through the ERP, core business software platforms and solutions (presented on the figure as Existing Information Systems). There are attempts to make mathematical calculations and directly connect operations and strategy results with information mismatches and content scarcity.

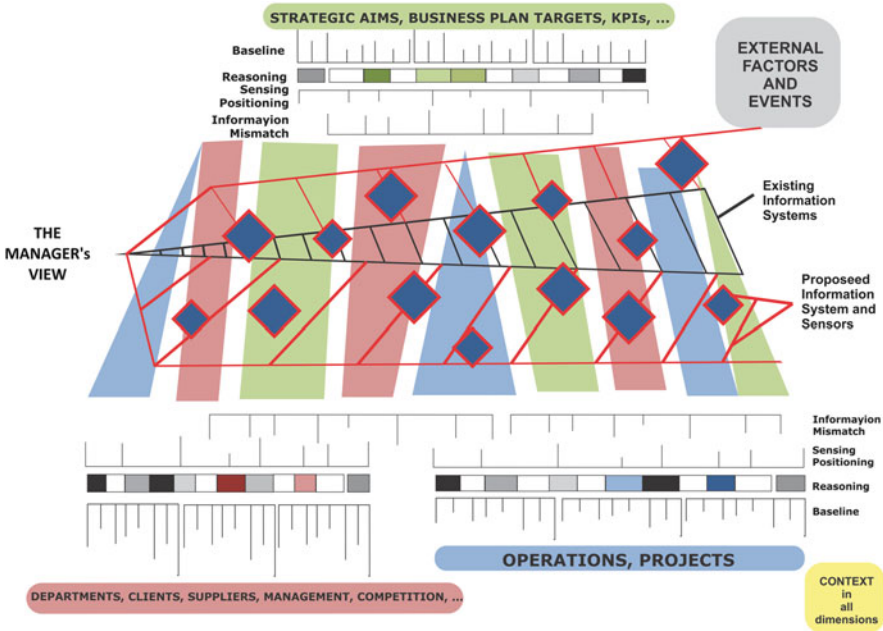


Fig. 1.6 Visualization of the current vs. possible structuring and positioning of the scope of information system entities for tactical management (Source: Author)

Through proper structuring of the information flows, broadening the scope of entities and events that the manager is capturing to a much wider view than usual (where managers see only their internal resources and capabilities) and by continuously setting and repositioning the information flows according to the current context, the manager will be able to receive much more appropriate and context-sensitive information in order to behave accordingly. Because tactical management faces so many givens as described earlier, this is of primary importance.

Throughout the text, on occasions, the expression “tactical manager” is used. It denotes the person performing the tactical management function—which is a role almost every manager has. We are not referring to the tactical manager in terms of a position in a company, because of the fact that the top managers become “tactical managers” when they deal with tactics, while middle managers frequently shift into the role of tactical manager and operational ones too. When observing positions—mostly middle managers are dealing with tactics, hence, determining their role as tactical manager. But projects also deploy tactics, as do top managers when organizing how to achieve strategy—in such instances each of these actors fill the role of tactical manager.

We are proposing that for tactical management one needs to think in terms of “system design,” not process flow, content-wise. The system a tactical manager sets up should be adaptable—one should be able to make modifications to it, so that consequently it adapts to changes. The articulated purposeful adaptable mechanism

should provide a framework for the manager to steer and for people to follow. The Tactical Management Information System should thus capture and assist this behavior appropriately. Tactical management can be considered a capability in the sense that it represents an ability to deliver a certain business value continuously, while the circumstances are dynamically changing [as denoted by the concept of business capability (Stirna et al. 2012)]. Tactical management is also a dynamic capability, defined as the ability to integrate, build and reconfigure internal and external competences to address the changes in the environment (Teece et al. 1997). Tactical management facilitates continuous adaptation of an open system of interrelated entities to achieve goal(s) through dynamically changing expectations, resources, circumstances—by maneuvering in response to what is given.

Current information system models and solutions address tactical management in a rudimentary form—mostly because they do not consider its specificity and needs (Chap. 2). The information system supporting tactical management should provide continuous context capture, broad scope of information entities and a diverse type of information attributes. At the same time, it needs to support a systems view and handle the mismatch between the incoming data and expected outcomes. By addressing tactical management as static, rigid, mid-term planning oriented, and a process-prescribed managerial function that is similar to strategic or to operational management, the information systems will not support in an effective manner this uncovered source of competitive advantage.

Our work follows the direction of the dynamic alignment modeling discourse of Danesh et al. (2015) who provide a framework to offer systematic methods and tools for capturing, representing, and reasoning about enterprise and IT capabilities when codesigning organizational and IT architectures, as well as the runtime adjustments of Zdravkovic et al. (2013), along with dynamic capability modeling for strategic management (Stirna et al. 2012). Our work complements these approaches with the goal of shaping and addressing the dynamic capability of tactical management, its adaptability and information systems. Our specificity concerns the way to achieve it by placing a focus on the person—the manager. We are situating the research in the domains of Management and Information Systems. In order to emphasize the adaptability of this capability, we based our solution on a managerial method that endorses strategic adaptability [based on the Sense-and-Respond framework (Haeckel 1999, 2016)] and developed and applied it for tactics. To map its information requirements we incorporated components in the method which enables information systems to continuously self-design and revise. We are arguing that by enabling the design of a personalized information system by the person in the role of manager we contribute an important component in the realization of the adaptability, i.e., dynamic capability of tactical management toward effective business-IT alignment.

1.1.1 Main Research Questions

To summarize our problem-focused investigation of *how the tactical manager should think, reason and act, in order to facilitate the accomplishment of a purpose,*

the research aims to produce an artifact as a method for the person stepping into the shoes of a tactical manager that embodies principles, guidelines, and prescriptions on how to achieve adaptability for the tactical management function and proper information system self-design. We thus address the following research questions: (1) *what are the Tactical Management adaptability needs*; (2) *which are the Tactical Management Information Systems requirements*; and (3) *how can a method be designed for a person in the role of tactical manager that addresses those needs*. The support for adaptability is the primary goal of the research, hence the first research question is to find out what the adaptability needs are. Tactical management is mostly about achieving a purpose within given boundaries (goals, resources, limitations imposed by/opportunities offered by contextual factors) that can change in unpredictable ways. It is also about initiating change to achieve a purpose. Hence, adaptability to unpredictable changes in givens and to initiated changes is the “key” to success in tactical management. Support for adaptability is sought in the design of information systems that are specifically directed toward the support of tactical management, hence the second research question: how to translate the adaptability needs into information system requirements. Finally, while the first and second research questions are meant to deeply investigate the problem, the third research question is targeted toward looking for a solution: a method to design a managerial and information system that addresses the adaptability needs of tactical management.

1.2 Positioning of the Research

We are investigating a few interdependent problems—tactical management’s need for modern definitions and recognition; its adaptability and tactical management’s information systems design. It is necessary to derive the second and third from the first, while emphasizing the emergence of adaptability as the most significant feature of tactical management as a managerial function.

1.2.1 *Strategic Managerial and Management Information System Support*

Strategy determines the goals of the organization along with the set of coherent choices concerning the allocation of resources, activities, and approaches to realize those goals. The main concerns of strategic management are effectiveness and organizational alignment. Strategic management involves strategy formulation, implementation, and measurement of strategic benefits realization. Support for these activities is available in the form of a rich and diverse set of conceptual tools and management instruments (e.g., Balanced Scorecard, Strategy Maps, VMOST analysis, SWOT analysis, the Value Chain concept, 5 Forces Analysis, the

Performance Prism). Business Informatics research has integrated such techniques in the design of several modeling techniques providing understanding, analysis, and design support for strategic management [e.g., the Business Motivation Model (Berkem 2008), the Business Intelligence Model (Nalchigar and Yu 2013), the Business Model Canvas (Osterwalder et al. 2010), and the Component Business Model (Cherbakov et al. 2005)]. Furthermore, strategic management information in the form of scorecards and dashboards with KPIs is offered by different types of enterprise information system (Neely et al. 2001, 2003).

1.2.2 Operational Managerial and Management Information System Support

The key element in the contemporary view on *operations* is the process (e.g., production process, service process, or business process in general). The main concern of operations management is process efficiency in terms of cost, time, and quality. Appropriate managerial methods and techniques include Six Sigma, Theory of Constraints (TOC), Total Quality Management (TQM), (Lean) Six Sigma, Statistical Process Control (SPC), Agile, and others. Operations are nowadays characterized as a “high frequency—low latency environment” (Khan 2013).

1.2.3 Tactical Managerial and Management Information System Support

Compared to operational and strategic management, relatively few managerial methods and techniques relate to *tactics*. The managerial function most closely involved in the practice of tactical management is project management—addressed with PMBOK, Prince2, Scrum, and MS Project. However, a project is “a temporary endeavor undertaken to create a unique product, service, or result” (Project Management Institute 2004; PMI 2008) and “must be completed by a specific time, within budget, and according to specification” (Wysocki 2009)—tactical management continues for an undetermined period of time and requires a “systems” approach and capability for adaptability rather than a “projects” approach and predictability.

In Chap. 2, based on an in-depth review of the literature we observed that when examining the support of information systems for different management levels, there is significantly less coverage of tactical management in general, while operational management has a nexus for solutions, followed by strategic management. There have been attempts at interconnecting business intelligence and performance management in a closed-loop approach (Kemper et al. 2013). For instance, the Business Activity Monitoring (BAM) approach integrates strategic and operational

management levels through closed loops, providing for tactical management informational input for an event-driven complement to traditional monitoring (Kim et al. 2007). The diffusion of BI into operational and tactical management layers has been coined Operational BI (Kemper et al. 2013). Another example is the Corporate Performance Management (CPM) Integration Grid (Rausch et al. 2013; Kemper et al. 2013) that attempts to provide a multidimensional approach where the tactical management level is cohered to the strategic level. In general, we concluded that there is a significant “ingestion” of tactics by operations or strategy resulting in a scarcity of information systems and business informatics modeling and analysis tools that support the specificities of tactical management. These specificities relate mainly to taking a systems view of the organization (rather than a processes or projects view) and the need for right-time information on contextual changes (rather than real-time information). More than anything else, tactical management information systems should help to realize tactical management’s essential feature of adaptability, as much as it was associated with mid-range planning in the past.

The main threads of answers (investigation elaborated in Sect. 1.3.1) with regards to how appropriate the IS in the company is for the manager dealing with tactical issues—have been that strategic dashboards don’t capture the current context, while the operational real-time data is too overwhelming and not needed for tactical management (with some exceptions). The interviewees all had different interfaces (paper, electronic, combined) for organizing the wide variety of obligations deriving from their tactical management function. In terms of reporting for tactical management needs—the users addressed a struggle between daily, detailed operational reports, and periodical (monthly, quarterly, annually) reports, usually being too late for something to be effectively improved. The interviews shed light on the notion that numerous entities (stakeholder, other department, external collaborator) or events (developments) are not captured in the information flows for tactical management. With regard to the managerial methods, the users practiced Agile, Scrum, Microsoft SureStep, Waterfall models or any method or tool implicitly incorporated in the IS. The finding of an unaddressed mismatch of incoming data and expected KPIs has been consensual for all.

The offers open to systematic methods and tools for capturing, representing, and reasoning about the enterprise, its subsystems and the IT capabilities when codesigning organizational and IT architectures are scarce. Danesh et al. recognize the need to “(1) represent and monitor the environment in which the enterprise is situated, (2) represent and analyze the strategic objectives and positioning of the enterprise (Teece et al. 1997), (3) design flexible and reconfigurable enterprises that enable transformation (Combs, 2011), and (4) specify and build adaptable services that can adhere to changes in their context and deliver value to consumers” (Danesh et al. 2015). Complementary to these needs, we investigate whether for tactical management there can be person- not organization-oriented support for IS design; handling the mismatch of incoming data and expected goals; incorporating risk management; using visualizations for communication and orchestration purposes; supporting systems design.