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THOUGHTS AND STRATEGIC MANEUVERINGS OF BUSINESS QUANTUM

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Abstract

Objective
The main purpose of this research is to shed light on possible strategic maneuvers in order to pass the course of the implementation of quantum technologies at the level of companies. The challenge is also cultural and societal. This research is supported by an analysis of the contributions of research with a multidisciplinary analysis - strategy, computer science, linguistics, sociology ... - to the concerns of quantum Information Technologies (IT).

Design/Methodology/Approach
It is an expertise of four decades of experience in research and IT management this study is focused on a case study methodology in a philosophical approach return of thought on itself. It focuses on thought models that support IT disruptions through an analysis of graphical representations of the evolution of IT innovations.

Results
This research and analysis realizes, on the one hand, a current state of digital/quantum IT enabling the extended enterprise, and, on the other hand, approaches and models for the development, implementation and operation of the quantum IT service in organizations.

Originality
Research in critical and conceptual thinking based on the disruptions of IT innovations. It focuses on the key success factors of absorptive capacities in co-trust.

Keywords

Individual Data, Data-Centric Diamond, Quantum Reasoning, Technology Curves, Quantum Imagination, Quantum Strategic Maneuvers, SMIT, Absorptive Capacities In Co-Trust

The technological breakthrough by the quantum of Strategic Management of Information Technologies (MSTI/SMIT) is profound. It began at the beginning of the second decade (2010...) in communications through the installation of intercontinental cables. Today is the beginning of the development of computer programs on computers announced by computer manufacturers. It is necessary to make a balance sheet and a state of IT in companies. It is a question of bringing out the concepts and bricks that allowed the construction of the models of the IT service in order to better jump towards the future quantum IT upheaval. IT can radically change business strategies and overhaul business competitiveness. "ICT enables firms to: reach consumers that most competitors cannot serve profitably; offer radically new value propositions to consumers that other firms cannot deliver in a cost-efficient way; and put in place value chains that no other firm could do efficiently. ICT also allows strategic innovators to scale up their business models quickly and so protect themselves from competitive attacks" (Markides and Anderson, 2006, p. 129). In the approaches to innovation in enterprises, Power (2009, p.257), cited three: diffusion of innovation (DI), organizational innovativeness (OI) and process theory (PT) researches. IT has a total and rapid-disruptive impact on these approaches. These theories of innovation are perceived as: "complementary rather than as competing paradigms" (p. 273).

Understanding the ins and outs of the economic and management intelligences that have guided our approaches for several decades is essential in order to situate our strategic positioning. This paper makes its scientific contribution to the field of MSTI through the understanding and openness to finalized models serving the transition to quantum. In front of us only brief years, by 2025, for a total takeover of quantum IT opening up new

perspectives for strategic developments. All the major nations are working on it and putting in place roadmaps and reflections.

Methodology

This research underpins the quantum reasoning model in the field of business concerns. After a thorough analysis of this reasoning, the case study approach is divided into two sections: The first section focuses on understanding the phenomenon of IT disruptivity, and in the second section, it is an analysis of the most important disruptions that have marked the last forty years (1980-2020) that is dissected. The graphical representations supporting IT strategies form the basis of reasoning and the thought guide of MSTI and technology management. In this research they are analyzed and taken into account according to their contributions in the disruptiveness of quantum IT.
In this research, priority is given to areas of research that have modularized the orientations of IT writings and practices. The methodological practice of computer applications has meant that in the face of the great complexity of computer development modularization is a sine qanun condition for the success of IT. Designed in such a way as to quickly give an understanding of the challenges of the computerization of society and companies to pass the quantum course, digital cartography (mind map) offers this possibility. In their research on "Information Technology Governance, Business Strategy and Information Technology Strategy" Ilmudeen and Malik (2016) produced a mind map (p. 125) grouping together concepts related to IT strategy. It provides insight into the complexity of SMIT's domains. Their maps in its design are not of a quantum approach while the two maps made in this research are of a quantum approach (p.9 below).

This vision is also based on a very broad documentary research conducted by major themes including: ICT economic development models, IT managerial thoughts, IT impacts on organizations, technology and innovation management models, different curves of representations of technology and innovation...

This documentary research combines critical thinking in order to "jump into the future" by carrying out a balance sheet or an inventory of IT to develop future strategies. It generates a priori an analysis of the "past towards the future". The two case studies in this paper are action research studies. This research is also based on four decades of experience in IT management research and practices. There is a total involvement of the researcher. It creates a "return to oneself" by combining theory and practice in companies. There is an entanglement and validation between the two intelligences.

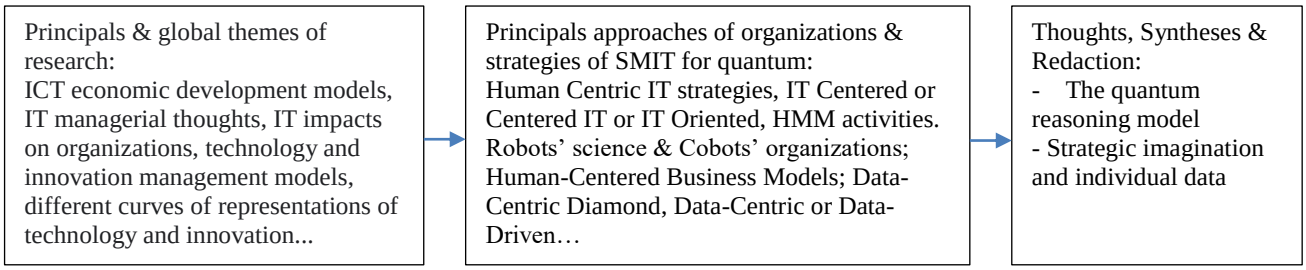
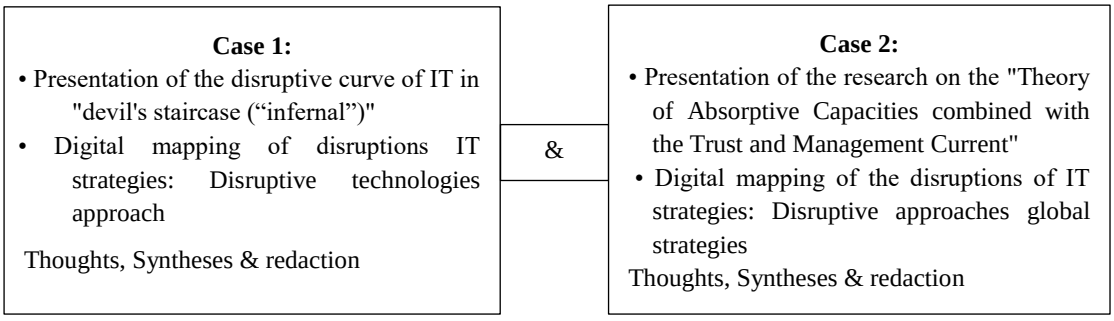


Figure 1 : The case study approach in three steps of this research

1) Preliminary step: the important types of strategic maneuvers of innovations for business quantum



2) Case study step : Disruptive technologies approach & Disruptive approaches global strategies
3) Final step: Discussion & Conclusion

Thus, the search for completeness guarantees a global and serious perception of the MSTI phenomena of companies. Confronting the reflections with those of researchers and practitioners, the maps made offer two very enriching views to develop and guide the future strategic maneuvers of economic decision-makers by

distinguishing the mode of reasoning of IT. After the presentation of “The quantum reasoning model” and “Strategic imagination and individual data”, below, two cases are presented:

Case 1:

- Presentation of the disruptive curve of IT in "devil's staircase"
- Digital mapping of disruptions IT strategies: Disruptive technologies approach

Case 2:

- Presentation of the research on the "Theory of Absorptive Capacities combined with the Trust and Management Current"
- Digital mapping of the disruptions of IT strategies: Disruptive approaches global strategies

The quantum reasoning model

All writings on quantum refer to the human brain. Quantum is our way of thinking. A lot of medical research also experiments with reading the "history" of the sequelae of diseases in the brain. This is medical imaging using quantum. This is quantum MRI. It is a kind of serology of the human body from the information contained in the brain. In the same way, all the actors of the sciences are looking at the subject. It is a matter of reasoning model using entanglement and superposition of brain state. For example, in the field of decision-making, "the model of reasoning hitherto known must be rethought. During the process of reflecting on a choice to be made, there is not only one opinion on one issue but one opinion on several reflections at once. This is called the "superposition of states" (Cassandra, 2021) Thought would follow the laws of quantum. Faced with a choice, the brain would stand in two simultaneous states, like particles subject to the laws of quantum physics. According to Ikonicoff (2020), "like particles that can be in two quantum states simultaneously, our brain would be in balance at the time of choice, straddling two possibilities. Human thought would be quantum! This idea of quantum cognition is supported by brain imaging experiments. »

The quantum graphic representation

Graphic representation is like the semiotics of text and image (Jappy, 2018) or like the rhetoric of advertising composed of figures forming supports guiding the conduct of thought processes. Reflection, as Lefèvre (2016) notes, "triggers a distancing from a situation that allows it to be studied by returning thought to itself. Despite different terms, it is always an awareness that results in the emergence of new knowledge, explicit or implicit, establishing links with previously acquired knowledge". For example, digital mapping provides and is a very interesting and practical way by "the return of thought on itself". It can be used to achieve self-return. Critical thinking is based on objective and demonstrative reasoning in order to clarify one's position towards a subject, an opinion, a system... Today there are different methods and tools to help critical thinking from elementary school to university. The graphic representation by mind mapping is one of them. Kervyn *et al*. (2014-1) uses the term delinearized: "In professional spheres, as it is found to be used, the mind map (also called mind map) corresponds to a delinearized configuration of reasoning, thought or representation" (p.1). In this research the design of digital maps will attribute to an opinion several reflections at once. It is a rapprochement with quantum reasoning.

The classification of graphs could be done in linear and non-linear, mono and plural, simple or fundamental and global... The question of linearity or non-linearity has been much discussed by linguists. The first to take an interest in it are the semiologists. In the field of road map mapping, in semiotics or graphic semiology, "the scientific approach in cartography; the most complete was published in 2013 in the online journal, Cybergéo (Reymond and Cauvin, 2013). This diagram [...] emphasizing the links between the stages in order to understand and identify the place and role of semiotics in the path followed. (Cauvin, 2016)

The two mind mapping syntheses of this research is a brain imaging of four decades of research. Their creations are the result of several academic research projects and practices in companies and consulting offices. It's a real expertise backed by years of IT testing and investigation. In philosophy, this approach is distinguished by the return to oneself. The way and manner in which the brain has approached and designed strategic methods and maneuvers for companies immersed in globalized economies generates this entangled quantum return in itself. Martinet used the term “intriquer” (Jappy, op. cit., p. 26). Bohr in quantum philosophy uses the terms superposition and correspondence principle (Bunge, 1992, p.28) ... We are in line to approach the terms used in quantum by physicists. The same concepts must be corroded in order to design and develop quantum strategic maneuvers.

The decoherence

On the one hand, expertise in computer science, methodology in management informatics, methodology of the fields of business functions and methodology of management sciences and, on the other hand, the reading of the various researches in computer science, economics, management, linguistics, philosophy ... has led to the distinction of a notion manipulated by the various researchers: the entity. Can the entity be the door so much used by researchers of all disciplines on quantum? Can it be the integrator element to quantum thoughts? Is the

individual data entity (see below): "Language Entities"? "Quantum gates black holes"? "Black boxes"? "Database IT Entities"?... If all researchers coordinate their work in trans, plural and intra-disciplinary we will end up with more efficient systems because we cannot work without knowing the language of the other and not having the same concepts. The concepts used by computer entities in databases, for example the 12 Codd rules, must for example require a reading and adaptation of the linguistic entities in Ferdinand de Saussure and the researchers who followed him. Today we are in decoherence of our thoughts. For example, it is a question of taking charge of the discursive phenomenon of orientation (Gouvard, 2019) of quantum or logical gates.

The term decoherence is another problem for quantum science. Indeed, "preventing decoherence is a huge challenge for quantum computers, whose principle is based on the long-term storage of quantum states (Baker, 2017). Quantum is, according to the literature on this subject, identical to the thoughts of our brain. Do we have the same problem of decoherence described by Baker? Will quantum computers have "psychological" problems like humans? This is induced for "quantum thinking" AI brains. Decoherence for physicists is seen only from the angle of the meeting of quantum data and today's data i.e. classical. This confusion may not be observed for quantum management apps where everything will be tagged. Apps with important blurred areas for example in natural language, mapping, brain imaging... can induce confusions if we can say "psychic confusional Data".

It is similar to the similar, in "psychology it is a disorientation in space and time. Psychic obnubilation with memory disorders. It's a misdirection." We are not far from conventional computing where programs do not stop "running" for lack of bad programming. It is sometimes said "Bug or Loop" to infinity. We are soon announced a film where the robot at the end of the evening offers "love" to human women. This is generative AI and technological singularity. The words written above become applied to valid intelligent agents as in human psychology. In Japan, robots are part of their daily lives but they have achieved a cultural phase of several decades. Cultural in the psychological sense of the term where robots in domestic animals were part of their families. It is a learning phase of which we do not have psycho-sociological studies). It is thanks to these strategies that robotics, today in Japan, has taken over the service sector. Indeed, "the Japanese market for industrial robotics was 7.6 billion euros in 2019. That of service robotics of 7 billion euros in 2020" (CCI France – Japan, 2021, p.2). Support for the elderly is an important part of these investments to curb illegal immigration. "The government is focusing on technology, including intensifying the integration of robots into everyday life, at home, in stores or in the workplace (CCI France – Japan, 2021, p.4).

The strongest links with the concepts mentioned above with computer science is Data. Semiology, semiotics, linguistics... provide their support in computer science: the translation of texts by computer, the study of texts in natural language, meteorology, the design and monitoring of road maps... At the level of Big Data, semiology is used, for example, with computer science for the study of symbols and societal signs to understand customer and consumer behaviors. Individualized Data (see below "Data-Centric Diamond" approach) is the basis of qubits for quantum.

Will individual data be the way to the realization of the unfinished organization: transversality. Here too for his IBMQ computer we speak of quantum entity for the wave-particle Duality: "The wave-particle duality is the idea that each particle or quantum entity can be described as a particle or a wave, the most famous examples being photons (particles of light) and electrons." but, "[...] in particular the parallel manipulation of quantum objects, which is at the heart of quantum computing (Swissinf, 2022). The manipulation of information in transversal terms accomplishes transversal management. Described as utopian by some or having very limited characteristics in practice both for the administrative or service teams of the company or communities of practice... Ely F. in his research has distinguished the existence of a very important handicap that is trust. "By examining our community manager practices, we approach a management mode that we have tried to apply in the original form of a managerial maieutic of trust." (Ely F. 2015)

It is at this level that spin and the manipulation of Quantum Data intervene to allow this transformation in real time. Transdisciplinary in transversality could be done by agreeing on the notion of entity (see above). We are more interested in bosons (can accumulate in identical states) than fermions (half-integer spin quanton that can never coexist in identical individual physical states). The first work on the identical. "This relationship between spin and collective behavior can be demonstrated from the fundamental principles of quantum theory and the theory of relativity. However, the evidence is so complex that the deep reasons for this connection remain unintuitive" (Lévy-LeBlond, 2017). The layout of quantum computers will allow us to work and carry out research deepening these promising absorptive capacities in co-trust (see below case 2) of quantum entities for transversality. The complexity of these organizations is made easier with QCaaS. This will constitute a leverage for quantum thinking teams and expand business.

Strategic imagination and individual data

At this stage of quantum research, we can put forward some thoughts. Our thought patterns will develop thanks to new technological breakthroughs/continuities accelerating and developing relationships unimaginable twenty years ago. Challenges a priori very difficult to overcome in Human-Machine-Machine (HMM) activities pushing us to

fight artificial intelligence to keep human "superiority". The technological singularity is one of those technologies that disrupt all our beliefs, our intelligences, our lives... "Smart agents" will be part of our daily lives. The human quantum strategic imagination is to be preserved because it is its quicker role in leading our humanity into SMIT "Human Centric IT" strategies. Strategies in "IT Centered or Centered IT or IT Oriented" will diminish our human ability to preserve our strategic imagination in HMM activities. With Robots' science has advanced in Cobots' organizations. This research corresponds "to the field of companion robots. These Robots use AI techniques in computer vision or speech recognition to understand the needs of their interlocutors and offer a rich interaction as close as possible to that of a human" (Pipame, 2019, p. 102). Today the most used learning strategies are: robotic vision, imitation learning, self-supervised learning, autonomous learning, multi-agent learning to perform coordinated tasks (Pipame, 2019, p.103). The OECD has named her approach "The Human-Centred Business Model (HCBM)" for doing business between regulators, industries and public interest groups for have less struggling to identify alternative, more sustainable ways… This approach hasn't a support or a chart to guide business decisions.

In the short term, the "contamination" of approaches designed by Data-Centric Diamond machines, systems specific to quantum, will affect industrial organizations and then Business. There is confusion where Data-Centric or Data-Driven have been used for Big Data (see next paragraph). It is made of management models from the company's large databases. We make a shift and we find ourselves projected towards a machine concept of quantum in Business model. There are companies actually operating in quantum production model in Data-Centric Diamond. It's very different from Data-Centric and Data-Driven Business. In the United States, for Diamonds - Nitrogen-Vacancy (NV) center, there are "5 Companies Working with Diamond Quantum Computing: Quantum Brilliance, Diatope, Quantum Diamond Tech, NVision and "Element Six" (Dargan, 2022).

The clarifications made above, the proposals in 2022 of business models in Data-Driven and Data-Centric are very fashionable currently. In the field of management, we find the proposal of the World Economic Forum and Boston Consulting Group (BCG) in "Data-Driven Operations Are Key to Manufacturing's Future" (2021). Visvizi A. *et al.* (2021) define it as follows: "It is argued that data-driven organizations that integrate a strategic orientation grounded in data, human abilities and proactive management are more effective in triggering innovation" (p. 452). Their approach is oriented towards the use of Big Data ("Think human, act digital") from innovative start-ups. In the field of economic thinking, we have the Diamond approach developed by the economist Porter by his Strategic Diamond of the Industry in his book "The Competitive Advantage of Nations" (1990). It is not "Data-Centric Diamond" but developed into "black hole gates" these approaches could constitute quantum Diamond thinking organizations. Our mode of reasoning will acquire these thoughts to develop equivalent models but we remain very limited by the possibility of graphic representation in three dimensions (see below). The quantum machine will help us to have quantum models but our own human possibilities are limited. The basis of reasoning of quantum is the individual data.

The origins of individualized data in computational approaches, called data-driven design for app development, comes from decades of extensive research to build methods without processing. It is the independence or autonomy of the data of its use. Highly elaborate models have been built to lead to the development of quantum machine models.

Relational Database Management Systems (RDBMS) in data independence (Data) are the result of the work of computer mathematicians, the best known of which is the British Edgar Franck Codd. We owe them the progress on today's magnificent machines. Unfortunately, humans are held back by n-dimensions. At the mathematical level we are well in n-dimensions. In reality, visualization is limited to three dimensions. It is the cube of data. The fourth dimension is only possible by fixing a variable and working with three variables so we are in the fourth dimension. Cinema has made the return to the past or go to the future by creating a series that has had a great success "The Fourth Dimension". This observation is found in quantum in special relativity: "In special relativity, places and moments, or events, are represented by a set of points p, {p} = M4, absolute space-time. M4 is postulated pseudo-Euclidean, four-dimensional, so that event-points can be distinguished by a system of four Minkowskian (or pseudo-Cartesian) coordinates Xi (i = 0, 1, 2, 3). The distance, or interval between two infinitely neighboring points of coordinates Xi and Xi + dXi is given by a generalized Pythagorean theorem (Deruelle, 2022). It is of the fourth dimension and no more.

Quantum in qubit Data also processes individual Data but not only in 0 or 1 but with superpositions of 0 and 1. Can we go further than the data cube in business models? This is the question to which we expect answers to go further in our thoughts, to think broader, broader. It's about expanding our sphere of thought, being able to carry out more extensive business with our partners... The extended enterprise will thus be anchored in quantum systems that guarantee reliable and lasting relationships by improving the construction of the "co-trust" (See, case 2).

The curve in quantum is represented in hyperbole. This is the space-time relationship of general relativity (Einstein in 1905) and special relativity (Minkowski, 1908) in physics. Graphs and quantum mapping are still in their infancy (Perdrix, 2019). Digital mapping has developed enormously in education, research and professional projects, road maps... Not having a quantum computer and quantum graphics representation software but I realized the quantum paradigm with digital mapping: "an opinion has several reflections". So, my maps made are in

quantum! Exclamation mark because I have always made my cards like this. It's now that I realize I was quantum. This observation actually distances me from thinkers based on only the notion of "past to future". I'm in the present. During their careers most philosophers had at some point to address this notion of time and in particular, the philosopher Bergson (1859-1941).

Case studies

The search for a graphical representation of the technological evolution of innovations or technical progress can be done on a single technology and on a "bouquet" taking into account many factors and indicators of innovations of multidimensional trends.

In the following, case 1 concerns the evolution curves of innovations on technology. Case 2 concerns a "mix" of technologies affecting the global maneuvers of IT strategies in companies.

Case 1:

- ✓ **Presentation of the disruptive curve of IT in "devil's staircase"**
- ✓ **Digital mapping of disruptions IT strategies: Disruptive technologies approach**

In this case, it is a question of distinguishing the why and how of this proliferation of curve proposals in the background to find out if the devil's stepped curve meets the current needs of designing IT strategies of a technology. The approach is oriented towards strategic management.

Presentation of the disruptive curve of IT in "devil's staircase"

Since the implementation of the ICT Innovation Progression Act (2003), various researchers and practitioners have developed new curves up to and including the questioning of Moore's Law.

The proposal of the form in "devil's staircase" is actually a system and not a curve. Thus, the combination of innovations and technological advances (hardware, software and communications) gives us an irregular trend of sawtooth and staircase, very difficult to study. It is different from the s-curve, a regular four-step curve innovation, growth, maturity and decline.

The simple and regular step curve has been very applied, even in economics, as for example for industrial machines, having a stability and durability sometimes of 15 to 20 years. In the era of the digital machine, in France, the sixth or seventh industrial country in the world, "the observation is clear, the French fleet of machine tools is aging. Almost 50% of machines are still conventional machines" (Pa Rascandolo, 2017). They predate the era of digital machines and smart factories. It is thanks to the management of industrial maintenance that the life cycle of the machines has been very extended. They are also able to carry out outsourcing implementations in emerging countries and developing countries thanks to these machines. They extend their lives by more than 10 years or more. The gradual transformation of these factories through the integration of digital technology is possible. For example, the following technologies are offered to relocated factories to increase the life of these plants: Homogenization and progressive integration of IT management: MES (Manufacturing Execution System), PLM (Product Life Cycle Management), TQM (Total Quality Management) and, in particular, ERP (Enterprise Resource Planning). Thus, it is the approach of economic cycles that prevails. They vary from 45 to 50 years for factories. Economists attribute to the economic cycle ICT 40 years on average. The graphical representation is also in s-curve (see, below, Map 2).

The closest curve for ICT is called by mathematicians "the devil's curve". It's not about the devil but it's really hellish with IT strategies. It is a system. Small steps can be attributed to small stability such as "minor" software release innovations. Large levels at more important times such as app software changes. Toddlers invisible because minimal sometimes a few months breaking a given technology. The duration of individual use of smartphones is estimated between 23 months and 37, or between two and three years (Arcep, 2021). During this lifetime there have been several innovations integrated into the first version of the smartphone. Generally, an increasing figure provided for in the title of the device for placing on the market is incorporated. The innovations of the Operating System (OS) are two to three on each device. These innovations require more memory and storage so we also have innovations in these areas of operation. From these facts and because of the short duration of change, very minimal time, on the curve the innovations are represented in toddlers sometimes in sawtooth. This graphical representation is valid for all IT systems. The s-curve or regular staircase used only show the progression of a given technological innovation while it undergoes in itself several successive innovations. It is a fixed stagnant representation of an innovation but not an innovation incorporating new technologies requiring each time new strategic maneuvers of a new innovation.

This situation is identical to the case of factories where the improvement of machines, the relocation or the sale of factories in the developing countries require very different strategies and strategic maneuvers. For IT, it is a

question of carrying out adaptations and strategic maneuvers in the very very-short term that can displace markets, destroy a competitive advantage... affecting the survival of the company.

The elongated bearing in the middle of the curve, below, can be considered as an example of a somewhat long duration for the implementation of an "IT quantum" apps. It's not just a single technology but a tangled tech app. It is short and medium term for training in machine and network techniques, integration within companies, implementation of technical applications, realization and purchase of computer programs, functional start-up, user training, bug fixing... This approach is different compared to the generational changes of all IT, global approach (case 2), for example in 2011 for digital or 2003-2006... for quantum. It is a question of carrying out a SMIT continuously because the maneuvers are frequent.

The periods of stability also allow the liquidation of stocks / unsold and to prepare the various equipment and software of the next generation. In most cases it is the customers of Developing Countries who will use the liquidated equipment. It is only at this level that prices become affordable for the majority of the population in the developing countries. The players (strategic maneuvers) of these technologies stop all development on the old equipment. The launch of new IT products takes time. It is a transitional phase.

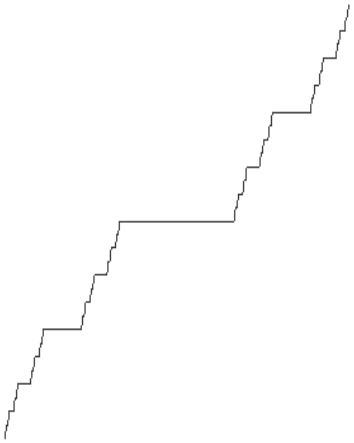
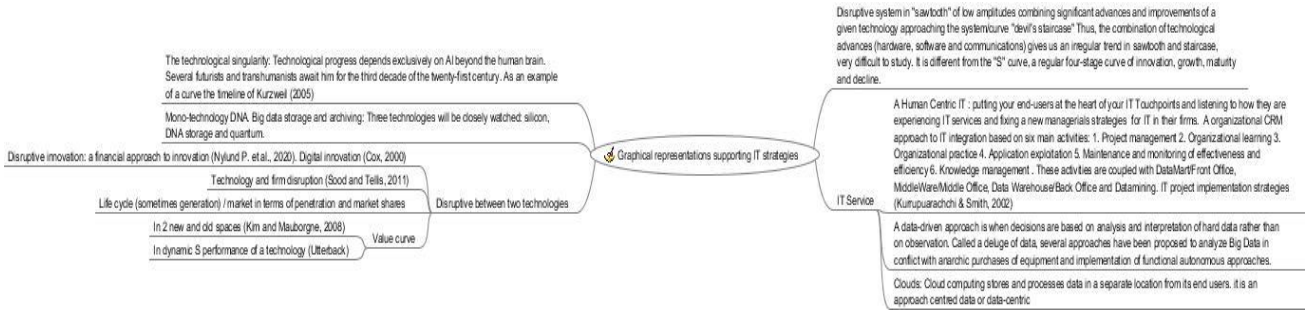


Figure 2 : Example of a representation over time of "technological breaks" by a "hard-soft-communication" combination of IT

Quantum bringing stability or slight breaks in technological amplitudes of several years in the technological management of companies. IBM's roadmap states that this transition to quantum computing in Hard/Soft is more than five years (2021-2026). On the following graph we have an example of levels:

We can have very variable stability levels depending on the technology. Innovations called versions are very short durations that can vary from four to six months only. It is short-term. Medium-term generations, for example mobile phones, can vary in duration from two to three years... According to the technology analyzed, we can develop a "devil's staircase curve" to study its past and make predictions for its evolution. From this curve we can make for a new technology strategies of its development on the market.

Digital mapping of disruptions IT strategies: Disruptive approach technologies



(A) low amplitudes combining significant advances and improvements in a given technology approaching the "devil's staircase" system/curve. It is this "trend" that best represents the progress of ICTs. It is different from Moore's Law in linear. (B) and listening to how they are experiencing IT services and fixing a new managerial strategy for IT in their firms. A organizational CRM approach to IT integration based on six main activities: 1. Project management 2. Organizational learning 3. Organizational practice 4. Application exploitation 5. Maintenance and monitoring of effectiveness and efficiency 6. Knowledge management. These activities are coupled with DataMart/Front Office, Middleware/Middle Office, Data Warehouse/Back Office and Datamining. Also, Kurrupuarachchi et al. (2002) have studied IT project implementation strategies.

Figure 3 : Graphical representations supporting IT strategies

Case 2:

- ✓ **Graphical representations supporting IT strategies: Global disruptive approaches**
- ✓ **Digital mapping of IT strategy disruptions: Disruptive approaches global strategies**

Global disruptive approaches affect strategic planning, company strategy, functional strategies, strategic maneuvers of companies... as well as public policies and sectoral strategies of a country's economy. In the following, in this

case 2, the global strategy approach is apprehended in the first section through the absorptive capacities in co-trust.

Graphical representations supporting IT strategies: Disruptive approaches to global strategies

The process that led to the absorptive capacities in co-trust that is a "Theory of Absorptive Capacities combined with the Trust and Management Current" was determined by digital strategies. In 2010, the latter required the systematic integration of IT into organizations. It was a question of carrying out strategic maneuver approaches where we must not hide the search for the profitability and effectiveness / efficiency of these integrations in companies by agreeing with the MSTI and having strategies in "Human Centric IT". Uses are filter indicators to distinguish the proposed curves of technological innovations. Technology itself only makes sense in its use. In reality, less than 3% of innovations arrive on the market without guarantee of success through its use in organizations. The failure is also attributed to the lack of support for the main activities - Project Management, Organizational Learning, Organizational Practice, Application Operations and Maintenance and Monitoring Effectiveness/Efficiency of Apps and Knowledge Management - of integrating IT into uses. IT is considered to be easy to use in the sense of a simple tool that does not affect the organizational transformation of companies. Like large systems, there is an anarchic integration of small systems leading to significant dysfunctions in companies and in all organizations in a country affecting the search for integration into international digital/quantum organizations. These systems are also harmful by Shadow IT systems. For example, the National Digital Innovation System (SNIN) improves the perception and support of the scope of strategic transformations of innovations. From time to time, it is also a question of analyzing the coherence of all information systems and organizations.

Knowing that innovations, 99.5% or more of which are related to ICT, convey knowledge and knowledge to lead to strategic skills and capacities of organizations. For example, this knowledge and knowledge that is part of the front office in Venn diagram "bouquet" characterize the multidisciplinarity or even the transdisciplinarity of innovations by uses. They are as follows: The approach to customer loyalty; The "user-oriented" approach; The knowledge approach; The "supply-demand" approach; The approach of sociologists; The approach to learning; The approach to societal processes and lifestyle. In the field of cobots, the usage approach is also different from the user approach (Benferhat *et al*., 2020, 2021). Knowing that innovations of which 99.5%, otherwiseIn the field of traditional computer engineering this difference between use and user also exists. For example, Constantine *et al*. (2003) have taken this into consideration and it makes it possible to achieve better software support during implementation in companies.

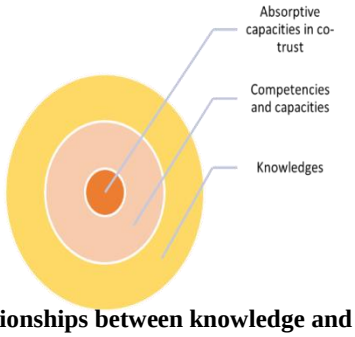


Figure 4: Relationships between knowledge and absorptive capacities in co-trust

This knowledge leading to skills and abilities through training, internal and external software developments, organizational practice... The aim was to achieve a comprehensive approach to achieve these objectives. The main question was: what is the most appropriate approach to conduct and organize the strategic reflection of a bouquet of technologies supporting the approaches of uses?

The passage of knowledge and know-how through analyses is done in competence and capacity to lead to the theory of absorptive capacities in co-trust whose main areas are the following:

- Interoperability (interdependence between the different systems from a functional and operational point of view while respecting standards...)
- Ability to absorb basic knowledge; Ability to adapt with interweaving skills; Capacity building necessary for technological development; Steering and financing capabilities
- Critical factors of absorptive capacities by examining the combination of organizational learning, the perspective of resources and the perspective of dynamic abilities with the level of previous knowledge
- Enabling capabilities...

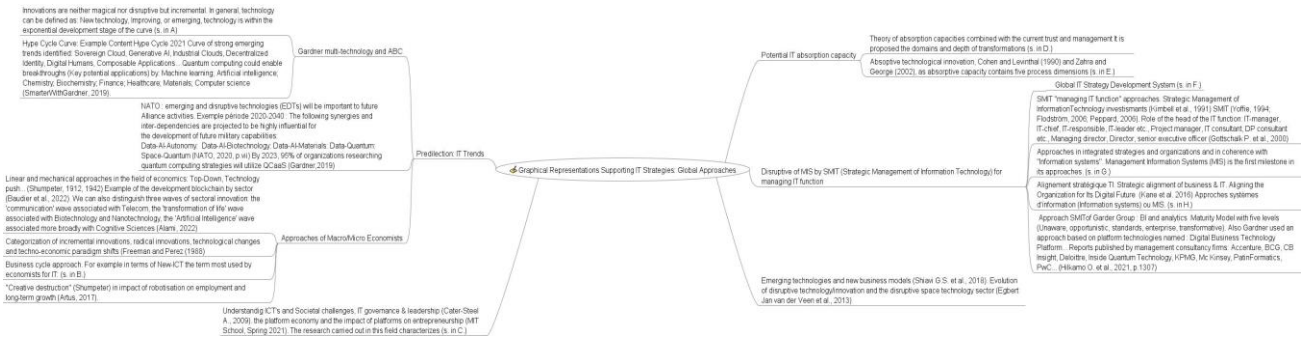
In the field of preparedness for absorptive capacities we have the reinforcements or consolidations of support for the realization, stimulation of technological innovation, development of tools of adaptation and technology transfer, manufacturing and support of implementation and use, drafting of detailed IT service contracts of the inter-company of international level...; the capacity to organize international collective relations... It is also research to promote political and institutional capacities, the co-construction of capacities, capacities to realize stock of human capital, capacities of a better quality of infrastructures...

The relations/negotiations win-win or approach « to-do-together » (Dupont L. et al., 2021, 2023) reinforce the theory of absorptive capacity combined with the trust and management curent. "Do-It-Together" (DIT)

approach "is a participatory design and collaborative production strategy that allows "global design and local manufacturing" involving "prosumers" (consumers/producers) in the manufacturing process." (Dupont L. and al., 2021) Hirscher A.-L. and al. (2018) noted that "The first studies on the collaborative creativity practices of the Do-It-Together have examined its impact on the creation of value in the fashion industry. Social, economic, environmental, knowledge, emotional and experiential values associated with the DIT were identified, generating positive externalities for all the involved stakeholders (customers, professionals and local producers)." It's extended firm demands absorptive capacity in co-trust.

This will result in companies being provided with the absorptive capacity necessary for the development of the extended enterprise. Extended obliging to deal with the many partners in confidence "co-trust" by having an honesty between the partner nations of the business.

Digital mapping of the "distruptivities" of IT strategies: Disruptive approaches global strategies



(A) after the first tipping point and before the second tipping point (Everett Rogers's diffusion of innovations, 2002); Mature technology; Aging technology. Six types of sponsors as innovators, early adopters, early majority, late majority, and laggards... (O'Leary, 2009; Mitre, 2021). The old strategy based on three choices and named ABC is proposed as alternative of Gartner curves. These choices are difficult to practice because the important parameters values. "In the ABC concept, "A" stands for adopt existing technology, "B" is buy it, and "C" is create it yourself." (Mitre, 2021) The urgent of used technology is pushing to by it. In most cases the previous technology is not fully mastered, 20 to 30% of the modules only, we see the appearance of the new one. It is a "sawtooth" curve that is observed. It approaches simple exponential smoothing but it is not.

(B) This cycle is in a single-curve (Expansion, Recession, Crisis, Recession, Economic Recovery or Depression) but it is global because it encompasses all sectors of economic activity. There is a direct link between the business cycle and fluctuations (Burn A.F. (1904-1987), Mitchell W.C. (1874-1948)). A duration of fifty years is attributed to an economic cycle. Concerning New ICT and innovations, "the Economist by drawing attention to the difficulty of putting barriers to entry (new competition rules in Europe and WTO pressures) in the markets for new technologies (faster appearance of "imitator" capitalists in Schumpeter's line of thought), which leads to the premature decline in the profitability of innovations. Other factors point in the same direction: doubling of corporate debt in a few years and excessive accumulation of productive capital (insufficient utilization rate of productive capacity) leading more quickly to "a trend decline in profits", in Marxist terms. Karl Marx is back even joked Patrick Artus (Artus, 2002). Can we therefore still speak of the Kondratieff in terms of identical repetition? (Tonglet, 2004) The intervention of institutional powers is numerous with each global disruptivity. Thus, for the quantum we have the public policies of strategic impulse to strengthen the competitiveness of companies and the preparation of the technological environment, examples: For Germany (Kagermann, 2020); For France (André et al., p. 16 et seq.; French Government, 2021); For Canada (Cifar, 2021).

(C) by a wide variety. Seven areas of investigation were identified as front-office uses (see above).

(D) to be carried out by public authorities, institutions responsible for technological infrastructures and enterprises for the realization of this economic model. The areas of investigation of this theory are divided into seven basic domains (Main dimensions) subdivided into economic models and management models (objectives of "capabilities").

E —valuing, acquisition, assimilation, transformation, and exploitation—we divide the relationship between absorptive capacity and technological innovation into three subsystems: external knowledge source, knowledge storage, and technology-innovation achievements (Zou et al., 2016)

(F) resulting from Austrian work to represent two successive and very different states of IT strategies. The combination of data and processing is a stepped curve in the form of a mathematical system (1886) offering after many technological breaks (hard and soft) periods of stability during changes in ICT generation.

(G) It's an approach "How can this information be stored and classified so that you can make the decisions you need to as a manager?" It has evolved into five systems (EIS, MIS, DSS, TPS, PCS but ERP systems are the most used and accepted model in the world. ERP is in the realm of "managing IT Function" by the Front/Middle/Back-office organization. For example, for small and midsized companies, "the SAP Business One application offers an affordable way to manage your entire business – from accounting and financials, purchasing, inventory, sales and customer relationships, and project management, to operations and human resources." For example, the back office, for a reason of security and survival of companies, it can only be manipulated by managers of the IT function exclusively or entrust outsourcing to a third-party IT.

(H) Strategic Information Systems _ SIS (Yoshikuni et al., (2018)). Management Information System Strategy (MISS) with "four distinct components: information strategy, information technology strategy, information management strategy, and change Management/ implementation strategy (Jamwal et al., 2011)

Discussion

After the deluge of data, we have the acceleration of treatments. The data deluge or Big Data has been solved by data outsourcing strategies like the cloud. Large companies specializing in data storage have emerged. The problem is solved for a while waiting for DNA technology, Silicon...

Big Data needs complex and fast processing. The "digital transformation requires the evolution of capabilities along four main trajectories of firm-user/customer relationships: the "timing," the "space," the "verso" and the "orientation" (Capurro *et al*., 2021, p.273). Quantum is this technology that approves the significant improvement of these needs. This is the quantum transformation. Moreover, as stated above, it is with a quantum reasoning radically modifying our sphere of reasoning by making it broader, more objective, broader... The process and transversal approach have made it possible to make organizations more rational and allow for digital and extended organizations. Here too, functional responsibilities have not been destroyed by transversality by not allowing disorder in decision-making and structural conduct. Shadow IT supported it. The management of the IT function is the guarantor of consistency and accountability in IT management processes.

These essential and basic components in the functioning of IT are conditioned by our behavior in the design of IT development strategies with quantum. For example, all states seek to reduce the unemployment rate, disease of all economies, the development of strategic maneuvers of quantum IT cannot ignore this factor. The absorptive capacity of quantum IT is a factor conditioning the existence and transformation of several sectors of activity. The theory of absorptive capacities combined with the current trust and management offers a framework for generating strategies for this development. For example, for interoperability and enabling capabilities, the most important are:

- ✓ The interdependence between the different systems from a functional and operational point of view while respecting standards...), we have in Interoperability and Enabling Capabilities:
  - → Storage & processing capacity; Knowledge management capabilities with apps AMI, REX…; Data management capabilities; Administration capabilities in analytics; The capability to store & manage a large volume of datasets; Capacity to analytical tools, analytical capacity; Capabilities of the platforms, capabilities of service providers…
- ✓ The ecosystems developments in intra and inter organizations, we have enabling capabilities:
  - → Big data analytics and firm performance: Effects of dynamic capabilities; Leveraging the capabilities of service-oriented decision support systems: Putting analytics and big data in cloud; Capabilities Saas, Laas, Byod, XaaS (Everything-as-a-Service), QCaaS…; Permanence of product monitoring (wide, middle, local, proximity, home connecting and IoT networks) coupled with 5P's strategies (Product, Price, Promotion, Place, Puce)…
- ✓ The ecosystems developments in intra and inter organizations of The Ability to absorb basic knowledge, Adaptability with interlocking skills and the Capacity building necessary for technological development, we have allowing capabilities:
  - → Human centric IT, strategy « I », Strategy "me"; Human capacity, strategy *« homo digitalus »;* Customs capacity in intelligence-led enforcement; Customs administrations thus need to build capabilities of receiving, storing and processing forms of data; Customer interface, sales & marketing, risk & fraud; "Benefitting from Big Data, Leveraging Unstructured Data …

These digital challenges, currently very difficult to master, on the one hand, requiring strategic absorptive capacities decisive for integration into value chains excluding the most laggards from their business and, on the other hand, requiring the co-construction of trust between the various partners increasingly varied and crowdfunding. For example, the ecosystems – platforms determined by Gardner 2021 trends before the transition to quantum are: Sovereign Cloud, Generative AI, Industrial Cloud, Decentralized Identity, Digital Humans, Composable Applications... Public intervention is carried out, for example in Germany, in four areas: Enabling technologies; Quantum sensing / quantum imaging / quantum metrology; Quantum communication and cryptography; Quantum computing; Quantum simulators (Kagermann *et al*., 2020). Emily Metais-Wiersch in her toolkit describing digital maturity gives a set of SMIT practices developed by companies into enablers. Successes can change an entire economy, for example Tesla in an entire sector (Metais-Wiersch, 2018). QCaaS will grow tremendously during this decade. Gartner in its trends has planned the development of "organizations researching quantum computing strategies will utilize QCaaS (Gardner, 2019). This requires absorptive capacities in co-trust valuing and allowing to have a power of development of companies (Kagermann *et al*., 2020).

All these systems require interoperability in Digital, Digital/Quantum and Pure Quantum in a long- and medium-term horizon of five years. Enabling capabilities will become more acute. Learning Word processing in "normal" costs, for example 250 Euros, enabling training certified by Microsoft costs ten times more. Having the capacity to absorb personnel with technological enabling capabilities is a guarantee of success in the digital/quantum value chain. All cases have become extensive. Human investment in "human capital stock

realization capabilities" in the SMIT is paramount. In 2020 "business leaders take stock of the state of their information technology. At present, they find that these technologies are too compartmentalized, disjointed, and harm the customer experience (McKendrick, 2020). The extended organizations so sought after by companies have not been at the rendezvous of Digital. In many research works it is claimed the opposite. In any case, the existence of an environment conducive to development is a condition for the success of companies' IT strategies (Wei *et al*., 2022). The French government in its actions has included in its objectives to structure transversally the quantum ecosystem of scientific and technical research (French Government, p.20 et seq.) in order to strengthen the competitive advantage of the France and constitute human capital.

The shortcomings cited in many studies are addressed in the SMIT through action-oriented approaches. This is the "Human Centric IT" approach of the IT department. The Theory of Absorptive Capacities combined with the Trust and Management Current guarantees the support and implementation of a staff allowing the decompartmentalization of organizations, the improvement of similar strategies and the real treatment of the customer experience required by business leaders. There can be no Digital and/or Quantum Business Chain without the response to these corporate grievances. In the quantum literature appears "Strategic Management of Quantum Information Technology -SMQIT- (Khan *et al*., 2021). You can't change the title of SMIT with every IT disruptivity.

Conclusion

All methods used by computer science are based on modularity and sets in mathematics. Then within a set of complex ways of thinking according to the professions of companies. This simplicity at the beginning of the reflection guarantees the possibility of creating interfaces, gateways and ecosystems. Unfortunately, by experience in most cases it is the method called "bulldozer" by computer scientists that prevails. Also, if a method was used at the beginning of the design, maintenance over time destroyed all logic and objectivity in the apps. If the methods take advantage of structured quality, over time we are witnessing a complex destructuring of app content. This is still valid in 2022. Ramani takes us back to the 70s for IoT because the problem is still the same. He wrote that we must ask questions about the simplicity of the application for employees, about integration with the rest of the ecosystem, about the flexibility of the apps, the strategic alignment with the company, about the development of the business (Ramani S. cited in Scibetta *et al*., 2018, p. 61).

These clarifications should warn companies and computer designers for this new strategic breakthrough of quantum.

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