Savvy Smart Solutions, LLC

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Strategic Innovation and Technology
General Management: Tools, Considerations, Measurements

Strategic innovation and technology are critical areas of business where products, inventions, and processes, as well as systems, applications, and parts of systems are invented and improved. Technology management is more than just application programming, buying electronics, equipment, computers, generating ideas, managing new technology implementations, or solving problems with computers. It's a combination of technologies focused on innovation, growth, and improvement. It is a collection of efforts and activities that impact more than just one environment. Because technology has a critical impact, and has often been viewed as complex, or world changing, and sometimes expensive or risky, it has a separate set of management activities.

Company, Business, System, Product Life Cycle

Stages of product life cycle are start-up, growth, maturity, decline and the issues the firm needs to address during each of these stages are different (Aspen, 2022). A non-profit research firm's products are research-based findings or reports related to the Technology Industry. Because it is not profit based with a standard product manufacturing process and is not available for sale in quantities at a checkout counter (in person and online), it is not categorized as a start-up which goes through growth and assesses maturity and market readiness, share, position, acceleration, and or decline. Its stages of growth are different, that while it does have a start-up phase, it does not assess its mission effectiveness against strategic organizational goals, although it can be in order for others to know its purpose and for it to follow its plan. Growth is not tied to profits or losses or number of employees. In some cases, it could be measured by skill, reach, numerical figure using reader statistics or other customized insightful report where action is taken on problems and solutions; these would be effectiveness measurements compared to its strategic goals. For example, Savvy Smart Solutions, LLC's goal is to become a non-profit, 501c3 company (a non-profit) and obtain grant funding to conduct technology research in several areas. Once this goal is achieved, another set of strategic goals can be created for the non-profit, with specific intent to inform, educate, or advise industry or the technical community.

For it to be an organization that is categorized and operates like other businesses, it needs a specific mission, with objectives, goals, and operations to achieve them. In pursuit of each goal, it would assess its maturity of any products or positions it publishes or takes, but scientific research is not based on a 'maturity model' of assessment. The business stages are best suited for companies who develop work products with a quality review board to assess product maturity, success, and have a system that evaluates the stages and progression based on an established set of factors tied to its development and overall strategic goals. Personal development measurements are different, where maturity is not one that is evaluated, unless a formula of knowledge is designed or a research model to show problem solving capability

improvement and growth in specific areas. The levels in the Capability maturity model (CMM) are not applicable to all areas of Technology, and best used in actual product development, or in artificial intelligence aligned with official CMM tracking as a personality trait, of which not many exist and is not the only function of measurement of rating advisories, age, or acceptance. The television warning where maturity references in technology are used are warnings such as "for mature audiences only;" a disclaimer used to warn viewers of adult content. It is not appropriate to measure companies or products this way, unless there is some numerical or qualitative scale, of which there is within the CMM. Media companies (or some other entity) categorizes the content programs with discretional advisement. TV-MA is a separate category of ratings for Mature Audiences Only - This program is specifically designed to be viewed by adults and therefore may be unsuitable for children under 17. This program contains one or more of the following: graphic violence (V), explicit sexual activity (S), or crude indecent language (L) (TheTVBoss.org, 2022). Maturity in peer groups or relationships are based upon personality assessments, which are evaluated against others' behavior in relation to their age and expected reactions or responses in situations or dialogs.

Software Capability Maturity Model

Setting sensible goals for process improvement requires an understanding of the difference between immature and mature software organizations. The goal to streamline, make more efficient, or to integrate data sources, and use is an example of a process improvement goal. In an immature software organization, software processes are generally improvised by practitioners and their management during the project. Even if a software process has been specified, it is not rigorously followed or enforced. The immature software organization is reactionary, and managers are usually focused on solving immediate crises (better known as firefighting) (CMM for Software, V1, 1993). Suggestion that a company, team, or process is not 'mature' seems an incorrect word to assess skill level and operational effectiveness of an organization or industry, or perhaps a fluffy and sophisticated way to say that youthful programmers or new processes react to the needs of management and are often behind schedule and such words require statistical proof, otherwise it is considered a discriminatory and negative categorization. A software company or set of programmer's project performance can be evaluated to determine schedule metrics and level of effectiveness, reporting they are able to program to specification, on budget, and schedule, or off, but such performance metrics cannot be standardized and summarized in three words or calculations because of the many project forces that impact the work efforts, both internal and external, therefore, it's unfair to categorize a company or software process because of the many varied conditions. Unless the company or programming task can perform the same multiple times and produce consistent results, with minimal variance, the spectrum of evaluation is different. A process is better evaluated using terms like efficient, fully integrated, stable, or the opposite, along with areas of technology measurement show its function and responsibility within the process. The more processes are replicated, that are the same, with minimal variation, the more predictive and efficient, if all factors remain the same – this is process predictability. Requests for information or documents are similar processes, in that the requestor completes a form and the grantor of the request completes its actions and sends the document. This is a process that many organizations use

regularly, therefore it can be programmed for more than just one place or system and a standard process created for all, rather than just one. Evaluating the processes and its variances is a task that can be reviewed for efficiency and effectiveness, as well as the necessity for human intervention. These can become automated processes for evaluation on speed, accuracy, data sources, and authenticity. Capability relates to whether they can do what is asked, within a specific timeframe and repeat the same results in differing circumstances or with different needs. Rarely is a software programming process the same, unless it is a computer replica that is automatic and runs in the same environment and conditions, or what is also called a routine process or procedure. People also function this way, thus human personality trait references are used to describe software programming process capability – an odd behavioral reference of a 'human process' compared to a 'computerized task.' A software process can be defined as a set of activities, methods, practices, and transformations that people use to develop and maintain software and the associated products (e.g., project plans, design documents, code, test cases, and user manuals). As an organization matures, the software process becomes better defined and more consistently implemented throughout the organization (CMM for Software, V1, 1993).

Age of an organization is not directly tied to its capabilities or work products and cannot be because each project varies depending upon the climate, team, requirements, resources, and other factors. Software programming and process management or improvement is perfected with experience and efficient project management tasking and when people are involved, conditions and environments, as well as other project details vary, especially with changing priorities and dependencies. Capability Maturity measurements are a negative attempt or another way of saying that the software programming processes are not perfected and cannot be replicated or expected to be exact in the same way that a computer application completes its programming procedures or functions. Maturity relates to the amount of time the process has been used when the correct term is age. Process accuracy, efficiency, and effectiveness are better defined as success project metrics used to evaluate the task of software programming, each taking place on varying schedules, budgets, and outputs of varying lengths. Changes in process are acceptable and encouraged because project conditions change, just as skill levels vary. Because one software programming process worked well for one type of system does not mean all software programming processes will be directly replicated or follow the same process model. This is necessary to understand because of differences in types of systems, some being small applications, while others are large multi-agency undertakings that require policy making, coordination, change, and larger implementation, which require more in-depth impact reports and studies. For example, a software development process for a system that spans across the nation will not follow the same process as one that integrates with five other systems that spans across a single county. The process on a high level is similar, but vary in the programming stage, and even more so when project resources change. A standard process can be created for developing a single internet site but will not follow the same programming process as developing an integrated database or software application that runs on a local machine. Software programming processes and measurements then, in that case are best suited automation, where pages are automatically created, or software packages replicated following the same steps and process when directly applicable. 30 million internet sites can be created that follow a standard process, if automated, but process will vary depending upon capability. Automation of some areas on the Internet is encouraged, but because of the design of E-Commerce is limited to individual organizations and their choice how and what they choose to automate.

**Maturity in Financial Management/Investments**

The maturity of an investment is a primary consideration for investors since it must match their investment horizon, the total length of time that an investor expects to hold a security or portfolio. An investment horizon can potentially range from as short as a few days to decades, depending on how long the investor intends to hold the investment to achieve their objectives (Investopedia, 2022). Maturity is a date on which a financial agreement ends, triggering the payment of principal with interest or repayment of a loan with interest (Investopedia, 2022). The financial and technology industry uses the two terms differently and are not connected using a scientific Return on Investment or Cost Benefit Analysis formula for investing purposes. In short, the CMM does not integrate or formally correlate with any Technology Investment Financial Management process or design. Contracts for development vary; some based on set labor rates for qualified engineers, and others based on milestones and agreements for payments based on specific deliverables, with many agreements made that do not show profitability of such software or savings gained from investment, which in turn translates to technology profits. Total Ownership Cost, using Earned Value Management techniques are not standardized for financial management or estimation of software or technology products; they are project-based principles on planned vs. actual values.

If a human programmer develops 30 million internet sites, then it follows the same process with variation, depending upon requirements and it is the same, unless continuous improvement methods are used and no change to development software are made. Capability maturity cannot be assessed and compared to the next project using humans unless all tools, environments, and requirements are the same. A company can be considered 'mature' and experienced, but face development challenges as new needs arise or as the development tools change and evolve, which is when projects should be assessed based on capability and not 'maturity.' Stages in human development cannot be compared to effectiveness or operational capability in software companies, as each 'developer' or 'programmer' and 'process' is uniquely designed or different from one another, with different skill, training, circumstance, and style. Community and land development is a different area, similar in process to software development and financial management where capability maturity does not apply but might follow similar stages in terms of readiness or return on investment. This 'cross over' or multi-use in terms is worth a closer look for standardization of process to see if technology follows, naturally, or automatically, the same financial and land development uses and application of terminology, thus improved standardization and management of process, instruments, national debts, and assets.

The research company does not seek to provide global strategic direction for Technology and Innovation, nor does it manage using a maturity model or metric, although it is reactionary to the institution for which it writes, with limited personal choice on selected topics. It exists to provide newly published research and qualified scholarly opinion on existing problems and possible solutions that follow a scientific research process. The research process matures the more it conducts formal scientific research and evaluation, therefore maturity is not a numerical number or stage referring to age, as it is already considered mature in its ability to identify, research, and evaluate using the scientific method. Maturity scales are not used in scientific research or process evaluation because processes are not given creation dates, therefore it is not

equivalent nor fair to measure maturity without a numerical figure or value to something subjectively or humanly evaluated as 'mature' or in other words, perfected, ready, stable, and effective or efficient on a measurement scale. Growth metrics or profitability is applicable to companies that manage using a balance sheet or profit and loss statements and annual reports. Non-profits are better evaluated based upon contribution statistics and impact reports or metrics. The same is true for generalized statements such as 'value added systems' or a firm or organization strategic goals stating it must 'add value' without a mathematical formula that measures performance, gain, and investment.

The purpose of Quantitative Process Management is to control the process performance of the software project beyond 'quantities' but in quantifiable measurements. Software process performance represents the actual results achieved from following a software process. The focus is on identifying special causes of variation within a measurably stable process and correcting, as appropriate, the circumstances that drove the transient variation to occur. Quantitative Process Management adds a comprehensive measurement program to the practices of Organization Process Definition, Integrated Software Management, Intergroup Coordination, and Peer Reviews (CMM, V1, 1993). If the CMM were actually followed and there was a 'quantified' metrics standardized process, then the measurements would be clearly outlined and could be followed or 'automatically' gathered and evaluated, however, each project or software programming task requires new 'quantitative' measurements individually developed that are applicable to the changed conditions of every task or project, leaving the only area of success or performance measurement (not maturity) whether or not the software is functioning as the programmer or programming team or company promised, and does what the customer needs and wants. Actual results achieved from a software programming process varies depending upon what level of 'capability' or 'functionality' is being tested and how many times (or attempts) were made to get it to function as intended. Maturity is not the right word: but functional testing metrics that are specifically designed for each requirement, feature, or function, within a set time frame, which can be reused and replicated is of greater value than to evaluate a 'company' or 'process' is at a specific level of maturity based on general or specific measurements that constantly change.
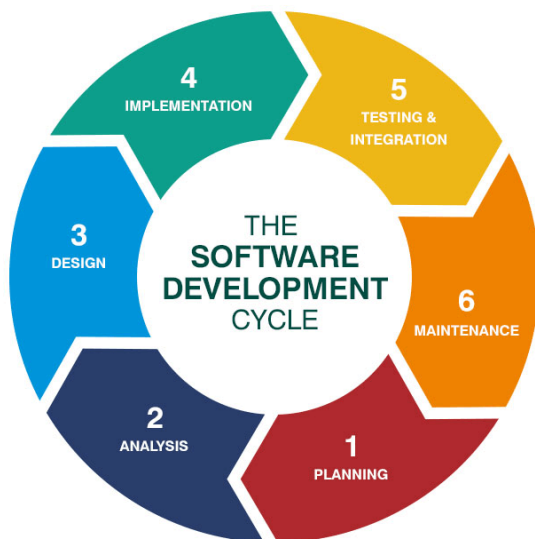
Software Development

The development process is called a 'cycle' suggesting it is an ongoing loop of planning, analysis, design, implementation, testing, integration, and maintenance. When in the maintenance phase, it is not concurrently in the planning phase, meaning that 'maintenance' must stop, for software development to re-commence. This depiction shows that the software will never reach an end state and does not map or lead to measurements in software process or capability maturity modeling or leveling. This means there is no real quantitative or qualitative formula whereby the software development process is strictly

managed, or graphically depicted to show capability maturity and readiness for release or when the cycle restarts or if it is a constant re-occurring process and works in conjunction with all its inter-related parts, such as an Operating System and Internet Browser. It is believed that the CMM, and SDLC are simplified models designed as a guideline, but not strictly followed by software companies. They are assessments that take place throughout the entire project in each phase, some without formal numbers assigned, called review, change, testing, acceptance, and support. Software is developed with an end state of delivery in mind, either for a specific client, problem, or process. It follows a process that goes on throughout the life of the product that is based on continuous improvement. Good software engineering looks beyond the product, but also related products, competition, and other areas that perform the same or similar functions for how it can work with others and be of value in more than just the original intent.

Developing Buy-In

Creating buy-in is applicable on more than one level; in one case, it relates to stock ownership, and in another, it is a concept of persuasion or gaining support for a cause or effort that leads to sale or approval. Buy-ins are not often directly known, especially if the audience, influencers, or decision-makers are not clearly defined, of which regularly change, depending upon what area is affected. Buy-in is related to participation, which often is created through product education, customer, client, or personnel involvement.

Developing support and agreement or "buy-in" is an ongoing process of gaining cooperation leading to acceptance. People cannot "buy into" an idea, or back, and believe in an idea or be expected to participate unless forced, which is when buy in strategies are best used. Since "buy-in" also relates to stock ownership, in publicly owned companies, or personal interest and investment, then it must be considered more than just a monetary figure. It's difficult to 'buy-into' an ideal or project or believe in it and support it, if nothing persuasive is presented, or

THE VIRTUOUS CIRCLE OF OPPORTUNITIES
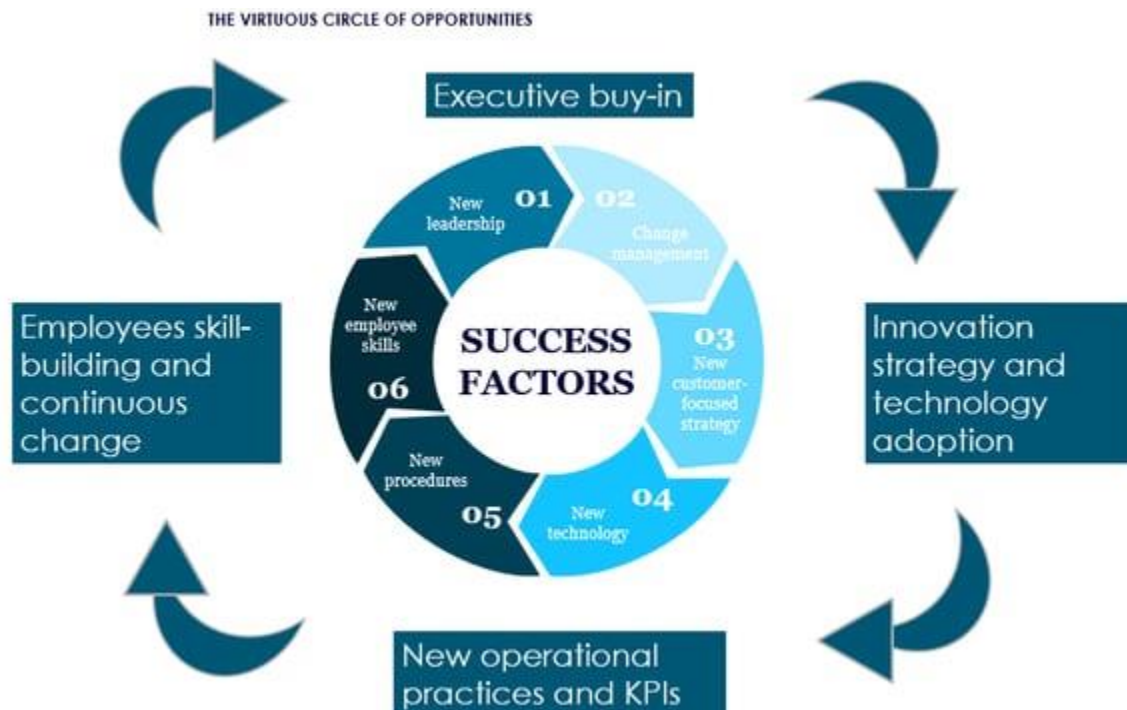
if there is no clear return on investment. A buy-in can also be a reference to a person or entity buying shares or a stake in a company or other holding. In psychological terms, the buy-in is the process of someone getting on board with an idea or concept that is not their own but nonetheless appeals to them (Investopedia, 2022). Creating 'buy-in' or generating 'buy-in' is considered a slang business term comparable to individual, unit, or group acceptance, participation, cooperation, and investment. Strategic planning is required because it's an area where support is needed, decisions are made, which result in long term commitment and participation, which often determines the success of a project or product. Without buy-in and support, projects face an uphill battle, friction, and resistance, that can delay plans or force change. Some great inventions, innovations, or ideas don't require buy-in, they are immediately accepted because results are obvious, while others require persuasion, presentation, forced implementation, formal agreement, negotiation, and contract management.

Life's Strategic Management

Life is managed by the setting of strategic goals using planning steps to accomplish something. Research and evaluation of organizations, products, processes, and systems is simply managed by scientific research, analytical review, and opinion based upon experience and lessons learned. No 'capability maturity model' applies, as it does include software development itself, but understanding the textually based scales and depictions of implementation plans, strategies, and models. Strategic management of technology and innovation is applicable in the development of life goals and management because technology and innovation are what is evaluated, not because of buying decisions, but because of the necessity of research and evaluation of old, new, and future innovations. Such decisions affect productivity, environment, and process; therefore, buying decisions and evaluation tasks are based upon needs, or select areas of review, which are not often completed using traditional methods of trial, use, training, and evaluation. The analytical reviews or evaluations are conducted based upon what is published as strategic direction, and methods for software engineering and technology management for multiple levels of organizations. To create a life strategy with many years left to go before application of upcoming learning is creating a goal with much time to produce more than just an end result. It is not that life cannot be strategically managed while learning, it can, therefore the strategic management of technology and innovation is applicable to the learning process. The best goals to set in this phase are to ensure the learner has the right tools, focus, and analytical ability to effectively learn, prove the learning, and utilize any new talents before they are replaced by newer ideas or concepts.

Sustainability, Corporate Social Responsibility and Ethics

To pursue sustainability is to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations (EPA, 2022). Corporate social responsibility should be tied to sustainability and ethics, in that, corporations should have some objectives directly focused on social improvement, community development, and manage their corporation with accountability for contributions made, knowing all facets of impact, and correctly or appropriately managing any damages or environmental problems caused from doing business. Ethics are another area of corporate responsibility with rules established that set and strengthen morals for its employees with a respectable set of ethics tied to who, what, where, and how they do business, managing conduct of its

employees and business practices to operate in accordance with the law with respectable and commendable standards.

Innovation Project Management

Project Management of Technology and Innovation varies on multiple levels but the same planning, leading, organizing, controlling, and coordinating exists, perhaps without finite schedules, large budgets, staff, and tools with critical milestones. The projects are short term research and evaluation tasks of processes and things, or systems and problems. It is not the traditional systems review, where a software product is evaluated for how it can best be used in the workplace, organization, or life, but how systems intertwine, cross-over, integrate, and don't or should. It also includes understanding of both internal and external factors that exist outside of the learning environment but are reviewed based on past operations and project experiences, as well as future business changes with the possibility that technology can advance even further and be an even greater force of positive change. Part of leadership and responsibility, corporate or social, or individual, is to promote and encourage innovation and creativity, whether that be venturing into dissecting radical or simple technological change and understanding it on multiple levels, from a small mobile application, all the way to a world-wide critical infrastructure system, as well as industry or what is considered standardized and authoritative guidance on what industry believes to be the best measurements to define capability, readiness, innovation, and management principles.

There is not a list of tools that one can buy or find to define how to effectively manage technology and innovation, but there are principles of both that can be learned, implemented, and followed, with assistive tools to prove that the principles or concepts work. The tools are customizable planning software, automation systems, performance evaluators, process managers, and efficiency experts, as well as strategic planners who are skilled at inventing, improving, and seeing or understanding systems and technology on a greater scale than a single application or an organization's technology portfolio.

Conclusion

Strategic Technology and Innovation Management is the planning, implementation, evaluation, and control. Strategy is the direction an organization sets for itself, and innovation is the creativity it uses to get there, whether it be a new product or idea, or the perfection of an existing one. With models such as the SDLC, CMM, Agile Development Methods, SCRUM, and other technology implementation strategies, especially when combined with financial management or estimation tasks used to determine Total Ownership Cost or Return on Investment, it is best to look at not only product engineering practices, but also what groups consider the cycle of innovation, best management strategies, and project management techniques for acquired systems. In addition, there are special considerations beyond individual or the purchase of packages, including how industry integrates, changes or shapes society and work efforts, as well as environmental impacts to not just the economy, but living or sustainability for humans and others. This requires an analytical view from multiple levels, not just the business process, and needs or requirements-based engineering, but also an evolution standpoint of world-wide strategic technology as more than just one firm in a world of many inventors, competition, regulators, and governing bodies and those who benefit from or are

impacted by its creation and use. This sometimes requires a retroactive review of technology's progression from the earliest inventions all the way to what is planned for or possible in the future, with a mind for investment, integration, improvement, and protection. Technology and innovation can in fact bring profits and gains, but this is not, and should not be a company's only focus when developing it or buying it. The greater impacts and purpose must be reviewed and well communicated or understood because it's not accidental inventions or 'reactive' development that serves us best, but evolving to be a more intelligent, efficient, and effective society that uses technology for its best benefit. Strategic management is an ongoing process through which the organization defines the nature of the business which the firm will be active, the kind of economic and human organization it intends to be, and the nature of the contribution it intends to make to various constituencies (White & Bruton, 2017). The maturity of a company does not predict success, but success can be measured starting with strategic planning and maintained with an effort to sustain if companies remain innovative. Using broad generalizations such as 'creating value' and 'effectively managing' are not specific enough to truly support the words, at least not without proof and some indication of impact to a selected area that is not solely focused on market disruption, domination, and other business words related to competition. While competition is good, technology and innovation must also be created with problem solving in mind, which might not always directly contribute to a profit, but a gain that can be translated in some form of benefit of necessity or comfort that improves human existence.

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