A Process Reference for Product Innovation and Lifecycle Management

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This Article introduces PLCOR, a SCOR[1]-like reference model for marketing and innovation management. PLCOR stands for Product Lifecycle Operations Reference. It spans all activities along the lifecycle from the first idea to mass adoption and product discontinuation. Key processes are

- Creating a new offering
- Go-to-market
- Deployment and value delivery

The reference is intended to be industry-independent and should apply to marketing and innovation management of both products and service offerings. It is linked to existing models of the Supply Chain Council SCOR (supply chain), DCOR (design chain), and CCOR (customer chain).

PLCOR's predecessor (internally called xPLOR) is used by a team in SAP for innovation management. A year ago, members of the Supply Chain Council formed a Special Interest Group in order to make PLCOR a standard.

Motivation

The authors believe that all outstanding marketing and innovation management operations have two characteristics in common:

1. Alignment: How well strategy and performance of innovation operations fit[2] with the company and the overall business strategy.
2. Agility: How fast innovation operations adjust to new or unexpected opportunities and requirements[3].

Ad 1: Alignment has two dimensions:

1. Vertical: Strategic trade-offs are cascaded down to individual activities. Alignment introduces an end-to-end perspective and helps avoiding local optimizations at the expense of the overall result. Can we draw a direct line between innovation activities and those of the CEO and the board? CEOs don't really care about the details of Go-to-Market or deployment. PLCOR supports interaction at the level of discussion they want to understand innovation operations: Top line (revenue), bottom line (margin), and long-term potential (adoption).
2. Horizontal: A process activity isn't executed in a vacuum, but as part of an entire chain of activities. Disconnects may prove fatal for the overall result. Rather than focusing on individual process improvements, horizontal alignment looks at how processes relate to each other and improves integration along the process chain. PLCOR facilitates this by describing relationships between processes.

SCOR-like reference models provide an abstraction layer, which enables **systematic** aligning operations vertically and horizontally. They are structured by process types, i.e. abstractions of individual processes. Process types define the task, its metrics, its input and output. They do not define, how something is done or who should do it[4]. Companies can apply the reference model

[1] The Supply Chain Operations Reference Model SCOR as well as DCOR and CCOR is owned by the Supply Chain Council
[2] For details on Strategic fit see [8]
[3] Derived from [15]
[4] They come with a list of best practices as suggestions, however.

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as a framework for their operations. The reference framework and the separation between process types and practices make it easier for them to substitute an existing practice with a new one. They become substantially more responsive to strategy changes or new market requirements, effectively increasing their agility.

So far, the Supply Chain Council released 3 process references, which cover high-level activities from Porter's value chain model as outlined in the table below:

Reference Model	Domain	Path of Execution	Match to Activity in Porter's Value Chain Model
SCOR (Supply Chain Operational Reference)	Supply Chain, Logistics	From customer demand to delivery	Inbound Logistics Operations Outbound Logistics
DCOR (Design Chain Operational Reference)	Product and Technology Design	From specification to product	Technology Development
CCOR (Customer Chain Operational Reference)	Sales, Account Management	From a relationship to a customer commitment	Sales
<No model>	**Marketing and Product Management**	**From first idea to broad market adoption**	**Marketing**

Table 1: Process references of the Supply Chain Council and their match to Porter's Value Chain Model

A process reference for Marketing is missing. The PLCOR model aims to fill this gap.

Marketing, namely product management, is different from product design. Philip Kotler quotes William H. Davidow, former Vice President of Strategy at Intel: "'While great devices are invented in the laboratory, great products are invented in the Marketing Department.' A product must be more than a physical device: It must be a concept that solves someone's problems."[5]

The American Marketing Association provides a good definition of Marketing: "Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large."[6]

Product Innovation and Lifecycle Management

A product lifecycle begins with product development and market introduction [1], followed by growth, mature and decline stages. Innovation is the successful introduction of a new product[7]. The term typically refers to the first stages of the product lifecycle. The bell-shaped lifecycle curve matches the stages to adoption levels; every level reflects a group of buyers with different expectations. Figure 1 outlines the first 3 stages of the lifecycle curve (see also [2]).

[5] [12] (New Product Development)
[6] http://www.marketingpower.com/AboutAMA/Pages/DefinitionofMarketing.aspx
[7] "Innovation . . . is generally understood as the successful introduction of a new thing or method . . . Innovation is the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services." [4]

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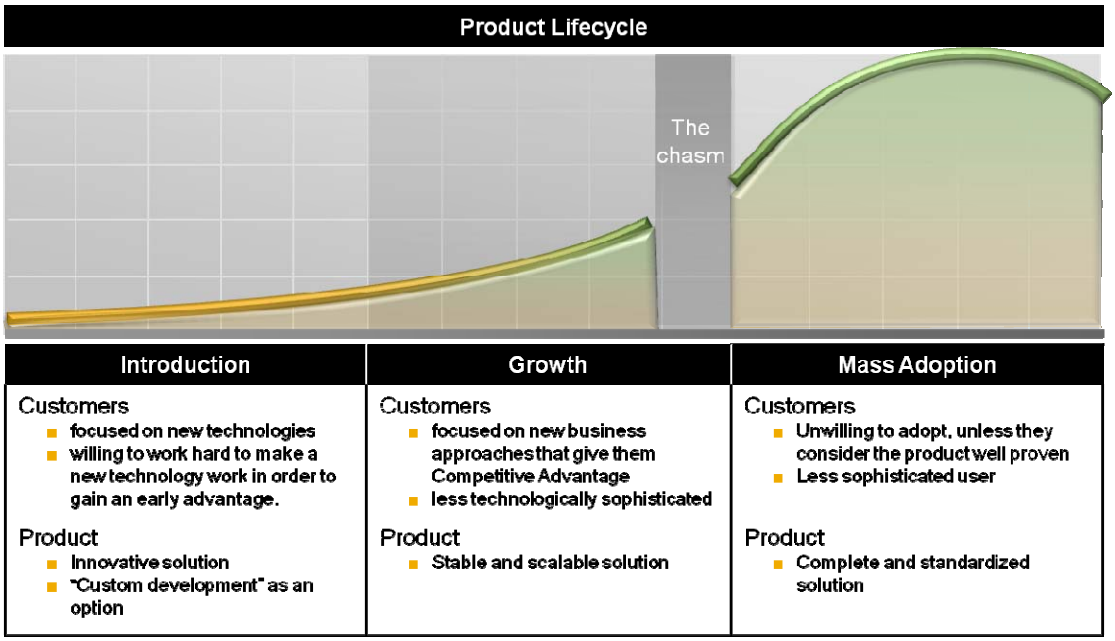

Figure 1: Groups of Buyers and their expectations along the Roger's bell curve for the product life cycle

Customers and their expectations change along the lifecycle. In order to reach market adoption the innovator adjusts his offering. Even if a product physically stays the same, the total offering in terms of the famous 4 P's (Product, Pricing, Placement, and Promotion) evolves along the way from market introduction to mass adoption.

Radical versus Incremental Innovation

Tony Davila differentiates between innovations in the business model (new[8] value proposition, value chain, or target customers) and in technology (new product or service, process technology, or enabling technology). Along these two dimensions he identifies 3 types of innovation:

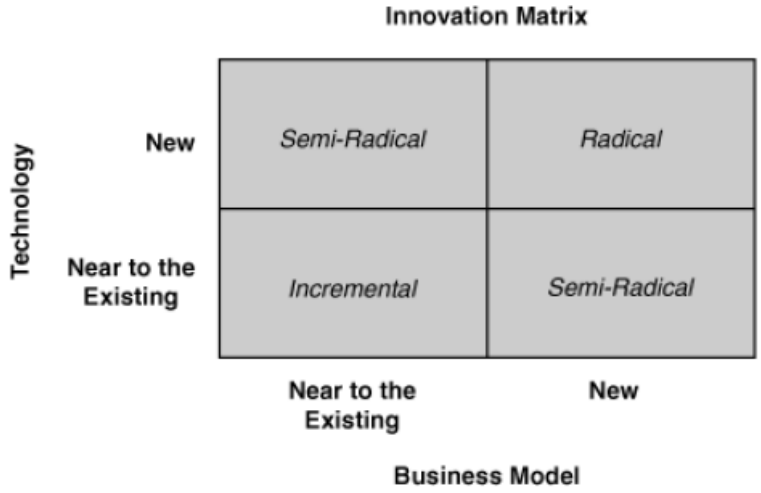

Figure 2: Innovation Matrix with incremental, semi-radical, and radical innovation along the dimensions Technology and Business Model [10], p14.

[8] With "new" and "existing" Davila always refers to the existing capabilities of the innovator. It is irrelevant to the classification in the innovation matrix whether other companies already created a product. What matters is the myopic view of the innovator.

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Incremental innovation embraces the existing technology and the existing business model. It yields small improvements to existing products, which are delivered into existing markets using existing sales channels. In contrast radical innovation leads to entirely new products, which are delivered in new ways. Semi-radical innovation encompasses important changes in one of the two dimensions, either the technology or the business model.[9]

From a BPM perspective the innovation types are relevant because established innovation processes typically work well for incremental, but not for radical innovations[10]. Semi-radical innovation is in the middle between incremental and radical. From an internal perspective a company can define it as "One or two steps away from our current core".

Major Tasks in Marketing and Product Management

In line with Philip Kotler, the major tasks in marketing are as follows:[11]

Marketing management is the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational goals.

"We see **marketing management** as the art and science of choosing target markets and getting, keeping, and growing customers through creating, delivering and communicating superior customer value."[12]

For managing marketing and innovation management tasks we identify three major execution tasks:

1. Create the offering. This starts with the idea and delivers a product ready to be released to the market. Creating the offering encompasses defining the 4 Ps: Product, pricing, promotion, and placement.
2. Go-to-Market: Communicate the value of the offering and contract customers or have users signing up. This includes running advertisements, hosting promotional events to target groups, filling the sales pipeline and selling.
3. Deploy the offering: The product is deployed to the user who consumes it. Key activities are the delivery of the product or service, the actual consumption, user support, and any activities geared towards helping the user capturing the benefits from the offering.

Along its lifecycle a product iterates with every new generation through the processes *Create, Go-to-Market,* and *Deploy*.

A frequently asked question is, whether *deploy the offering* should be part of marketing and product management. Isn't it rather supply chain management? Shouldn't innovation management end with the product launch or commercialization?

While there is no doubt that supply chain management is a separate domain, we believe that a holistic approach to marketing and innovation management needs to ensure that the customer receives the promised value. The product needs to be made available to the user and he or she needs to be able to consume it. If for whatever reason the user does not receivet value, this threatens market adoption and, thus, long-term profitability. Examples:

- Failure to consume: Software companies closely monitor so-called shelfware. Shelfware are software products or licenses that were sold but never used. Shelfware threatens any future business.

[9] See [10] pp 39-41
[10] „Radical innovation involves the application of significant new technologies or significant new combination of technologies to new market opportunities. " [6]
[11] See [16] p25
[12] [16] p6

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- Failure to satisfy: Negative word-of-mouth from disappointed consumers, which often spreads faster than positive product reports.

Without success in user consumption a new product will not move along the lifecycle but drop out of the market. Achieving the next stage requires customer success in the earlier one.

Additional marketing and innovation management tasks are:

4. Management tasks like portfolio planning or the definition of an innovation strategy. Planning is mostly done for a portfolio of existing and future products, not for individual products.
   Unlike *Create, Go-to-Market,* and *Deploy*, management tasks are performed periodically: Monthly, quarterly, or yearly.
5. Absorption of market feedback such as analyst reports or customer comments.
6. Discontinuation of existing products

All these tasks apply to free products like Linux™ or Picasa™, too. Because they are free-of-charge, there are no buyers who pay for usage. However, there are users and the makers of the products intend to gain market adoption. They need to win an increasing number of individuals who subscribe and benefit from applying the product to their work. Very much like a product for pay, free products win adoption only if their value is successfully communicated and delivered.

From Innovation Types to Process Categories

Depending on the innovation type (incremental, semi-radical, or radical), established innovation processes fit more or less. A company often has well-working processes for incremental innovation. Radical innovation, in contrast, hardly follows a clear path from beginning to end. It rather cycles through iterations. Neither the resulting product nor the innovation process is fully understood from the beginning. The product management process needs to be defined and adjusted on-the-fly. While processes for incremental innovation are workflow-like, radical innovation requires a project-management type of approach.

In order to translate the innovation types into process categories, we apply Shenhar and Dvir's [3] NTCP model to product management.. The NTCP model was originally created for project management. It has four dimensions to classify projects and arranges them into a spider diagram.

Dimension	Value Range
Novelty	Derivative, Platform, Breakthrough
Technology	Low-tech, Medium-tech, High-tech, Super-high-tech
Complexity	Assembly, System, Array
Pace	Regular, Fast/competitive, Time-critical, Blitz

Table 2: Dimensions of the NTCP Model

The center of the NTCP spider diagram (see Figure 3) represents a company's core - its current set of competencies and credibility in the market. The distance from the core reflects in every dimension the degree of disruption of a project, or in our case an innovation, applies. The total disruption correlates with the area, which the spider covers in the combined four dimensions. We apply these dimensions to marketing and product management.

Along its lifecycle a new product grows into the company's core. It becomes less disruptive than it was in the beginning. The diagram below outlines the shrinking distance from the core along Geoffrey Moore's life cycle for the NTCP-dimensions *Novelty* and *Technology*.

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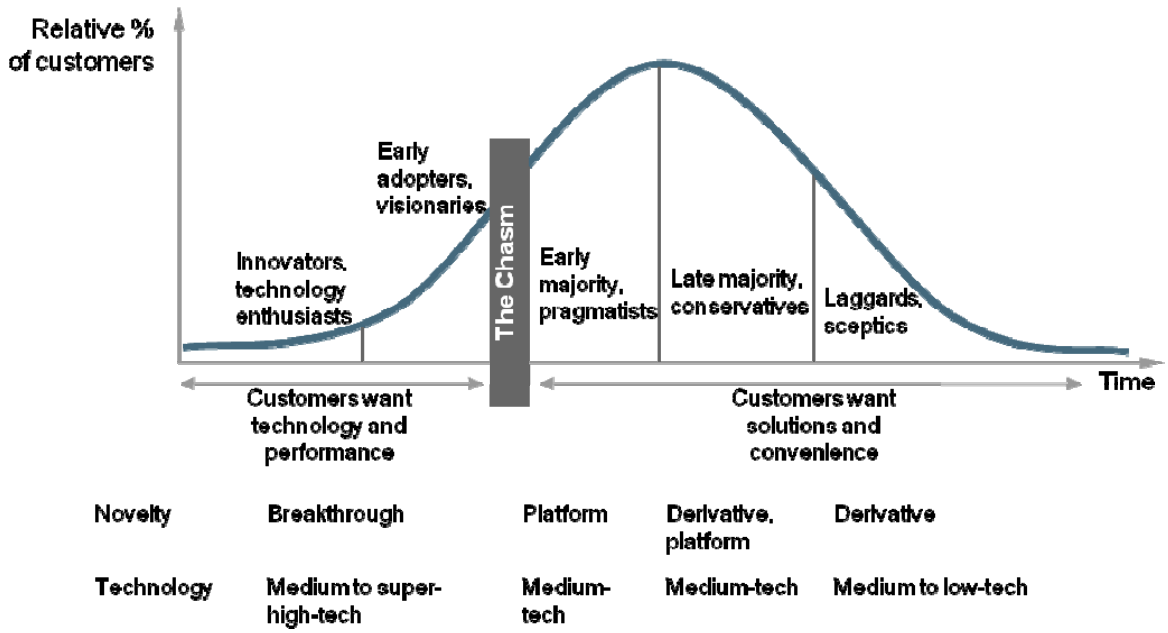

Figure 2: Distance from the core decreases along the product lifecycle. Source: Adapted from [3]

Depending on the dimension, distance from the core carries different risks. The table below describes each dimension and its impact on innovation management processes[13]:

	Description	Impact on Innovation Management
Novelty	Newness to the market; the extent to which the market understands the value of a kind of offering and is accustomed to consume it.	Reliability of market research data Degree to which product and process requirements are known upfront and how long to wait until requirements are frozen Best practices for marketing and strategies for market penetration Market research delivers fairly accurate predictions for derivative products. For platform products more extensive research is needed, carefully studying competing offerings and previous generations. As there is no existing market to study for breakthroughs by definition, this type of novelty needs early customer feedback and prototypes before the requirements are specified. While requirements are known upfront for derivative products and can be frozen early on, the final specification will be made during product development. Requirements for breakthroughs depend on intuition and need fast cycles of market interaction in trial-and-error mode.

[13] For details see [3]

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		Positioning for derivates explains the advantage over previous product versions. For platform products, positioning emphasized the product's advantages compared to competing offerings and the product's image. Positioning for breakthroughs focuses on getting attention of innovators and educating them about the product's benefits.
Technology	Technology represents the knowledge, capability, and means to create an innovation, communicate its value to the market, and deploy it. Technological uncertainty is often caused by a lack of available know-how.	The more technological uncertainty the more iteration for design, development, and validation is required. Specifications freeze later and team members need to interact more tightly and less formally.
Complexity	System scope, the extent to which new systems or organizations need to be established or existing ones need to be integrated.	Low complexity allows for less formal management-style, less observance of procedures and policies, and simple reporting. A higher degree of complexity requires more formal procedures for system and organizational interaction. Highly complex innovations, which E.g., bring together various governments, need to define their own standards and procedures as no industry standards apply.
Pace	Urgency, time criticality of an innovation. Innovations focused on a specific completion date may become useless if the date is missed, E.g., to solve the Y2K problem. Even more time-critical are innovations, which need to solve problems immediately, such as a pandemic vaccine.	Pace determines the autonomy given to innovation teams, the bureaucracy, the speed of decision making, and involvement of top management. For fast pace more autonomous teams, more attention to deadlines and more top management support are needed. Innovation processes need to be adjusted to the time criticality of the innovation. "Blitz" pace requires top management to cut red tape, effectively relying on less formal processes

Table 3: Description of dimensions in the NTCP spider and associated risks (excerpt from [3])

Along these dimensions we define three categories for the execution processes *Create, Go-to-Market,* and *Deploy*:

1. **Established**: The maximum disruption level reached in the process across the four dimensions is 1 (see Figure 3).

An *Established Create* process deals with a novelty rated "derivative", a technology rated "medium" or "low-tech", a complexity rated "assembly", and a pace, which is "fast" or "regular".

2. **Adjacent**: The maximum disruption level reached in the process across the four dimensions is 2.
3. **Disruptive**: The maximum disruption level reached in the process across the four dimensions is 3.

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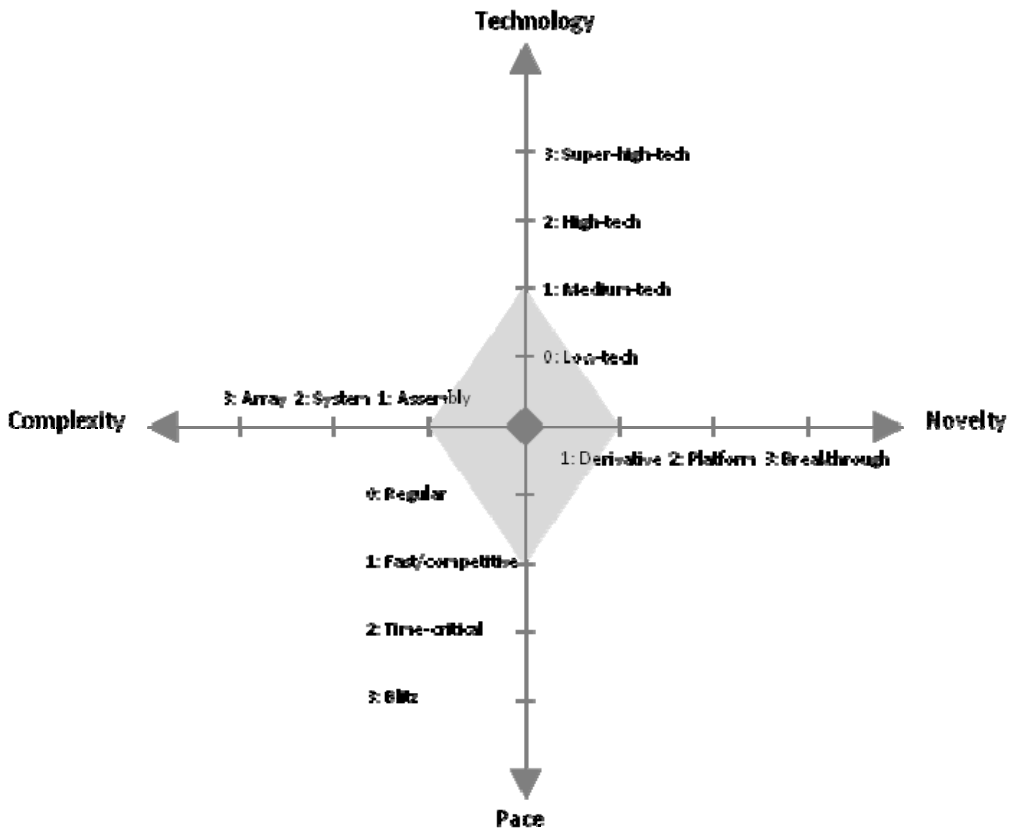

Figure 3: NTCP model with added numeric levels, adapted from [3]. Established processes can manage incremental innovation, highlighted in the light grey area. This area represents a company's comfort zone, their existing core of innovation capabilities.

A radical innovation typically is not disruptive in all product management processes. It may require a disruptive Go-to-Market process, but rely on established processes deployment. On the other hand, a disruptive Go-to-Market is not possible for an incremental innovation. By our definition, requiring a disruptive Go-to-Market would make the innovation radical.

The matrix below matches process categories for marketing and innovation management tasks to Davila's innovation types:

Innovation Type	Applicable Process Categories
Radical	Disruptive Adjacent Established
Semi-Radical	Adjacent Established
Incremental	Established

Table 4: Innovation types and applicable categories for processes

Who works in Marketing and Innovation Management

Execution units in marketing and innovation management are those parties who participate in creating, communicating, and consuming the product value. Innovation processes form chains between the following stakeholder groups:

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- Innovators, communicators, deployers: This category includes any organizations that, create innovations, communicate their value, or deploy innovations to users. It also includes any organization facilitating such activities. Typical groups are researchers, product managers, marketing departments, support departments, partner organizations for selling, consulting, or providing user support.
- Market players: Winning over markets is the purpose of innovation. Markets can be divided into market segments. They consist of users, buyers, intermediaries, value-added resellers, analysts, the press and anybody else who is a target for communicating the value of an offering or who consumes the offering.

Along a product lifecycle an innovator releases a product to several markets, communicates its value and delivers it to the users who consume the product.[14]

Purpose of Marketing and Innovation Management

Base for the alignment of marketing and innovation management is to understand and structure its contribution to business success. When is an innovation or marketing process successful? What value can a business expect to receive?

A company innovates to gain and sustain a competitive advantage. We look at marketing and innovation management as a trade-off between five business objectives, out of which 3 are market-facing, the other 2 internal:

1. **Reliability** → Deliver the right offering at the right time, at the right price, and at the right place. The right offering is the one, which maximizes the user value.
2. **Responsiveness** → Minimize the time to innovate and win market adoption
3. **Agility** → Ability to change to incorporate either omission or improvement detected during the process
4. Innovation management **cost** → Minimize the cost associated with innovation tasks
5. **Assets** → Minimize use of assets employed for innovation

These business objectives are in line with the performance attributes of the Supply Chain Council's reference models.

The PLCOR Reference Model

Architecture Overview

PLCOR is a reference model for marketing and innovation processes. Its architecture follows the Supply Chain Council's™ family of models SCOR[15], DCOR[16], and CCOR[17]. The power of these models derives from linking process elements, metrics, best practice as well as tools and features into a unique format. Advantages of using a reference model for business processes over other approaches are:

- A process framework defines a nomenclature, effectively avoiding ambiguity. The reference framework forms the base for benchmarking innovation activities. The elements of the process framework can be configured into individual process chains.
- A KPI Framework along the process hierarchy connects individual activities with result expectations on the board level. PLCOR provides metrics that directly link KPIs for everyone in the organization, from corporate goals and objectives down to the individual product manager.
- The combination of a standard for process and KPIs is a pre-condition for benchmarking; otherwise one would compare apples with oranges. In innovation it is pointless to

[14] There is an analogy to SCOR: Execution units in a supply chain are locations: plants, distribution centers, customer- and supplier locations. SCOR assigns every execution process to a location and maps the physical transport between the locations.
[15] Supply Chain Operations Reference
[16] Design Chain Operations Reference
[17] Customer Chain Operations Reference

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benchmark a disruptive innovation process against an established one. The PLCOR process reference maintains different structures to keep them separate.

- The reference model reduces complexity and makes operations more agile. It serves as an abstraction layer between the business and IT, tools, and practices. It refocuses the discussion away from IT features to business value. Rather than discussing specific marketing techniques PLCOR drives the discussion to performance and alignment.

The PLCOR-model is developed to describe the business activities associated with all stages of a product lifecycle, from the first idea through market adoption to the end-of-life.

Every organization that implements innovation and product lifecycle improvements using the PLCOR-model will need to extend the model to at least Level 4, using organization-specific processes, systems, and practice. It is important to note that PLCOR describes processes, not functions. It focuses on the activity involved, not the person or organizational element performing the activity.

The PLCOR model uses a hierarchical structure in line with SCOR.

Level	Description	Model Content	Application
1	Top Level	Define scope, context, and framework language of the Product Lifecycle Operations Reference Model: Define Process Types Define Performance Attributes Define Top-Level metrics	Differentiate the value chain by defining how to compete. Set targets for the basis of competition. Example: A “Fast Follower” translates the trade-off between long-term growth and risk into a specific operations strategy for marketing and innovation management.
2	Configuration Level	Define approximately 20 core process categories in terms of content, business purpose, and metrics	Differentiate lifecycle operations by complexity and capabilities of defined core processes. Configure a company’s product lifecycles at Level 2 from the 20 process types. Implement a company’s operations strategy through their unique product lifecycle configuration. Example: Should radical innovations start outside the company in a business incubator fashion? After a successful market entry should they get integrated back into the company?

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3	Task Level	Decompose processes into tasks: Task definition Task integration, their inputs and outputs Task performance metrics Best practices, where applicable System capabilities required to support best practices Systems, techniques, and tools	Define and model a company's ability to compete in its chosen markets: Design the information flow Derive target performance from higher levels Select best practices Example: Define Quality Gates for incremental innovation
4	Workflow level (Not a part of PLCOR)	Define practices to achieve competitive advantage and to adapt to changing business conditions: Sequence of steps Job details This level uses industry or company-specific language.	Define workflows for product lifecycle management Example: Design the procedures around a quality gate in the end of a product specification.
5	Transaction level (Not a part of PLCOR)	Define components of IT-systems or routinized transactions and their interfaces Link transactions Details of automation This level uses technology-specific language.	Define IT components and data flows between them. Example: Define how customer master data is passed between MS Outlook and SAP-CRM

Table 5: Abstraction levels of the PLCOR model[18]

The subsequent paragraphs outline the top three levels in greater detail.

Top Level: Scope, Content, and Performance Targets

The PLCOR model is organized around the five major process types *Plan, Create, Go-to-Market, Deploy,* and *Revise*. In addition, *Enable* processes prepare, manage or maintain policies and information needed in the five major processes. By configuring chains using these process building blocks, the model can be used to describe process lifecycles that are very simple or very complex using a common set of definitions. The model is intended to support marketing operations and innovation lifecycles of various complexities and across multiple industries.

[18] Levels are a derivate from those used from the SCOR model (see [7])

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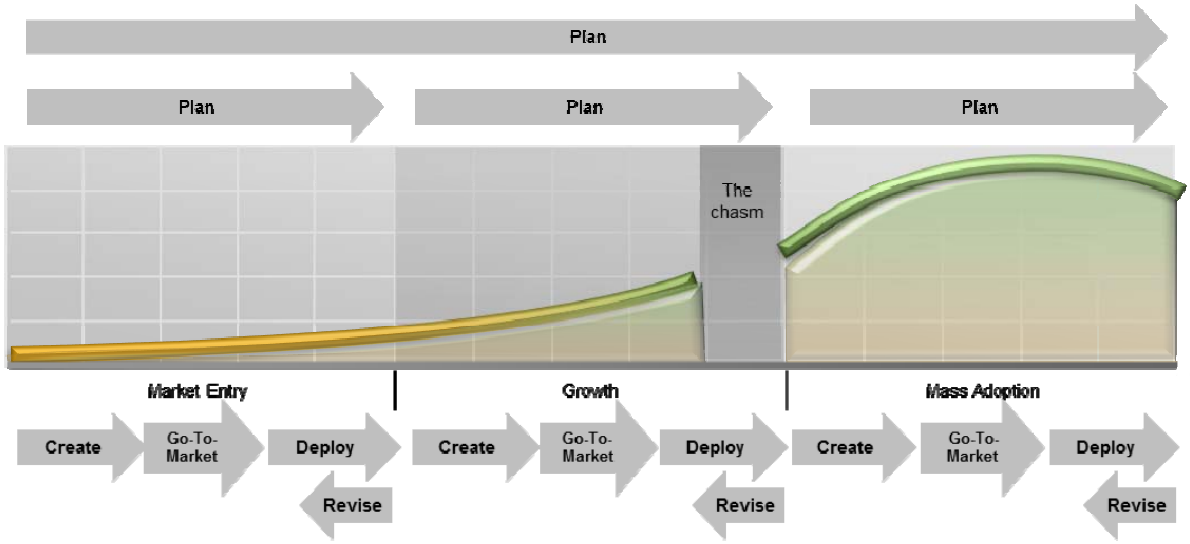

Figure 4: PLCOR's process types link together seamlessly across the various stages of a product life cycle

PLCOR spans all demand generation activities, all market interaction (market players, including customers and non-customers), idea management, innovation, marketing, deployment, and support activities. The table below outlines the scope of each process type:

Plan	Plan a portfolio of future and existing products
Create[19]	Create Offering: From idea to product release. Specify and define the 4 Ps • Definition, development of the product and its pricing • Definition of positioning: How to explain the product value • Definition of placement: Channels, eco-system, definition of supply chain
Go-to-Market	Communicate the value: From product release to sales success • Execute Go-to-Market activities • Communicate the value of the innovation such that users subscribe
Deploy	From sales success to customer value • Physically deliver the product or give access • User consumes the offering • Meet customer expectations, make users successful
Revise	Receive and channel market feedback • Feedback from analysts, press, customers, research • Positive and negative, solicited and unsolicited ideas

The model defines high-level requirements but does not address in detail research & development, supply chain management, or sales management. For these domains the supply chain council created the reference models DCOR, SCOR, and CCOR.

[19] We prefer the term "Create" over "Develop" or "Invent", because Develop and Invent suggest a technical invention. In contrast, Create also embraces when mainly positioning or placement are changed. An example is Repackaging of products into a new offering.

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How do processes for Plan, Create, Go-to-Market, Deploy, and Revise contribute to the success of marketing and product management? Level 1 metrics are strategic measures that express the overall success of an innovation across several life cycle stages.

Perspective	Performance Attribute	Level-1 Metric
External (Market)	Reliability (think of user value)	Customer Satisfaction Perfect Product Launch
	Responsiveness (think of market adoption speed)	Launch Cycle Time % Net New Customers % Net New References
	Agility	Launch Change Cycle Time
Inter-nal	Cost	Product Lifecycle Management Cost
	Assets	Product Lifecycle Management Assets

Table 6: Performance attributes and top-level KPIs

The performance attributes structure the metrics along the five objectives previously identified for innovation (see paragraph 0 above0 above).

Level 2: Configuration Level, Process Categories

PLCOR applies the concept of disruptiveness to the three execution process types *Create, Go-To-Market,* and *Deploy*. A radical innovation may require a *Create* process quite different from anything done so far but applies established processes for *Go-to-market* and *Deploy*.

In the early 90s client-server-based ERP systems were a radical innovation. Their makers had to find a way to create highly integrated and complex standard applications for business users. Established approaches to *Create* did not scale (E.g., custom software creation) nor did it address the complexity involved (E.g., software creation for PC users). ERP companies had to develop a whole new process to create their products.

Go-to-Market for ERP systems was different from what large system integrators did in the 1980s, but not radically different. While not identical, the *Go-to-market* for custom-developed software could be adjusted to the needs of ERP. Thus, the *Go-to-Market* process was *adjacent*.

Implementation and support (*Deploy*) of ERP systems again was substantially different from anything in the past and first had to be invented: How to support a large customer base where every installation is highly customized and partly modified? How to make implementation of ERP systems more efficient than implementation of individual software? ERP companies came up with new approaches to *Deploy*.

An incremental innovation works with *established Create, Go-To-Market,* and *Deploy* processes; the existing routines can be applied. The opposite of *established* processes are *disruptive* processes. They rely little on existing routines but invent new ones. This requires a lot of expertise and several trial-and-error cycles. *Adjacency* is in the middle between *established* and *disruptive*: The process is not routine, but with expertise the established procedures can be adjusted or customized.[20]

The result is a 3 x 3 matrix on the level of process categories and execution process types:

[20] For a more elaborate differentiation of routine processes, processes of mid-level and high complexity see [11]

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	Established: Established process. Routine.	**Adjacent: The process is generally understood but needs to be established and configured. Medium complexity.**	**Disruptive: The process is initially unknown. High complexity, trial-and-error cycles.**
Create	Create-1 (C1): There are established procedures to define the product, the pricing, the promotion, and the placement. Examples: Upgrade of a software product using the same technology A new version of an existing car type	Create-2 (C2): The innovation is adjacent. Defining the 4 Ps requires new expertise to cope with process complexity. The *Create* process can be largely configured upfront without cycling through much iteration. Example: The BMW Z3 in the late 80s. It used an existing 3-series car platform and very few new components, but integration and testing took place in the US as opposed to the traditional production in Germany.	Create-3 (C3): Design and execution of the *Create* process are not fully understood upfront or are highly complex; various iterations are to be expected. Examples: ERP Systems in the early 90s Microwave Ovens in the 70s
Go-to-Market	Go-to-Market-1 (G1): We use established communication channels and procedures, E.g., an existing sales organization. Buyers or subscribers are familiar with the value of this kind of offering. Example: Microwave Ovens in the 70s	Go-to-Market-2 (G2): Medium-complexity due to at least one of the following reasons: We target a market segment never targeted before Buyers or subscribers are less familiar with the kind of offering. We use a new channel for sales or market communication. The value needs to be explained. Example: ERP Systems in the early 90s	Go-to-Market-3 (G3): We start a radically new way to communicate with the market, to sell, or we offer something buyers are not used to. Example for a new way to communicate with the market: The BMW Z3 in the late 80s[21] Example for a product buyers are not used to: Post-it notes in the 70s
Deploy	Deploy-1 (D1): We use established supply and support structures. Consumers have experience in using this	Deploy-2 (D2): Users can get accustomed with reasonable effort to this kind of offering. Established supply and	Deploy-3 (D3): Consuming or deploying this kind of product requires a new way of thinking on

[21] „BMW decided to leverage the buzz of the Z3 and invest 60 percent of its marketing efforts in nontraditional venues. The goal was to generate interest in the Z3 two years before product launch. The nontraditional approach included, among other things, launching a tie-in with the new James Bond movie, *Golden Eye*, featuring the Z3 as a gift item in the Neiman Marcus catalog, and featuring the car in an interactive BMW home page on the Web.“ [3]

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	kind of offering. Example: The BMW Z3 in the late 80s	support structures do not fully apply. However, we have the expertise to design and implement the needed structures and processes. Example: Microwave Ovens in the 70s	behalf of users or a new way of supply or support. Example ERP Systems in the early 1990s required users to align to the standards of the ERP-vendor. Deployment procedures had to be invented first. Euro-tunnel. Technology mostly established, but deployment had to bring various governments and corporations together

Table 7: Process disruption matrix for Create, Go-To-Market, and Deploy (most examples taken from [3])

There are several reasons to differentiate *Create, Go-to-Market,* and *Deploy* by their degree of disruptiveness:

1. Different degrees of complexity and risk (see **Error! Reference source not found.**)
2. Different tasks to be performed (see below)
3. Different performance expectations and performance metrics

Ad 2: The different tasks to be performed result from the different degrees of complexity and risk:

- In *Create-1 (*established *Create* process*)* the market is well understood. There is no need to first study the market as in *Create-2* (adjacent *Create* process). When the market does not exist, yet, and, thus, cannot be studied, the *Create* process needs to be disruptive. Here one would iterate through prototypes rather than running market studies.
- A *disruptive Go-to-Market* typically requires first building and setting up a sales and marketing organization. For an *established Go-to-Market,* a company would rely on its existing organization.

Ad 3: Process performance expectations regarding reliability, time-to-market, and cost vary by the degree of disruption: "A company needs to pursue both continuous improvement and discontinuous innovation. Continuous improvement is essential, but discontinuous innovation would be even better. A greater sustainable competitive advantage can come from discontinuous innovation, albeit at a much greater cost and risk."[22]

For incremental innovations one expects more reliability but less market growth than radical innovation. It is pointless to benchmark established innovation processes against disruptive ones. Separating the benchmarking by process categories helps to avoid that. In addition some KPIs are more appropriate for disruptive innovation processes, others fit better to established innovation processes.

Error! Reference source not found. gives an overview of all level-2 processes:

[22] [12] Chapter „Innovation"

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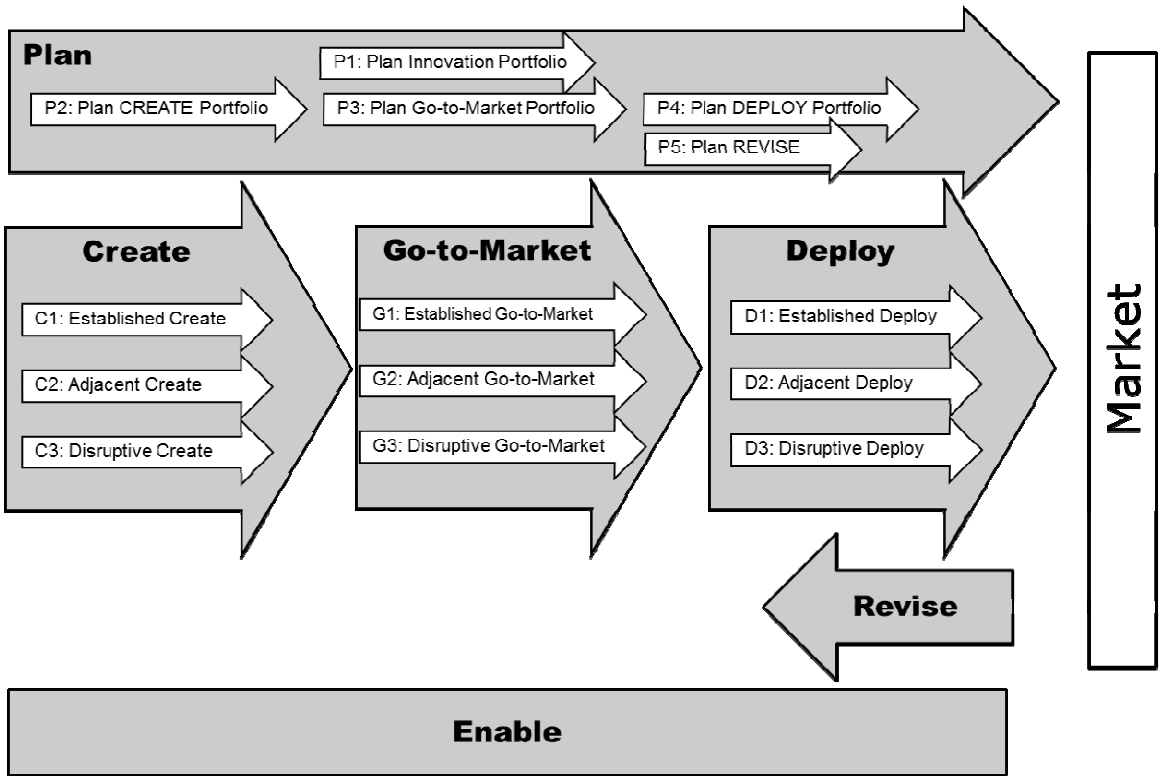

Figure 6: Overview of Level 2 processes

Along the lifecycle of an innovation the processes *Create, Go-to-Market,* and *Deploy* typically become less disruptive. Those who execute the process (marketing department, the sales force, and most important the buyers) get used to the new way of marketing, selling, or using the product. The PLCOR level-2 processes form a chain along the product lifecycle. **Error! Reference source not found.** illustrates this for Software-as-a-Service (SaaS) in the 2000s:

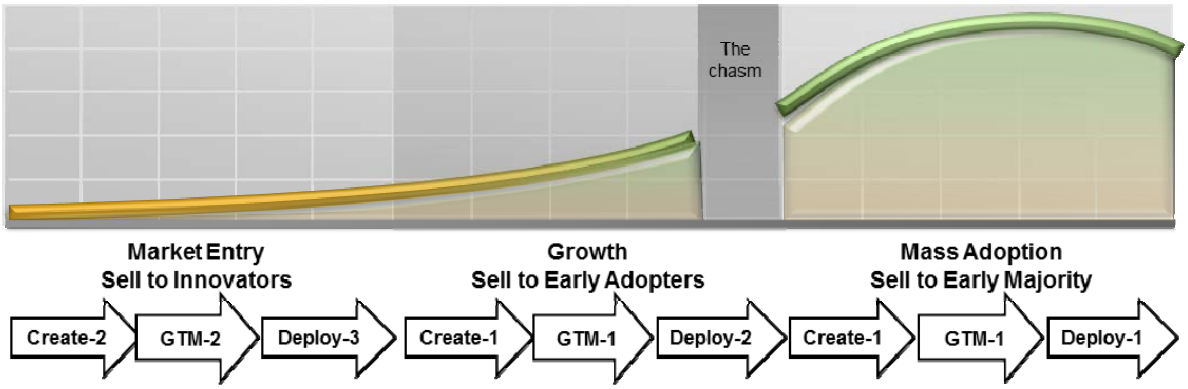

Figure 7: Process Categories along the lifecycle curve of Software-as-a-Service

During market entry in the early 2000s the deployment model of Software-as-a-Service for business applications was radically new. E.g., in on-premise software the customer was responsible for validating the software. This shifted at least partially to the SaaS vendor. Thus, the *Deploy* process, which deals with installing the software and validating the quality, was disruptive for software companies used to deploy on-premise software.

In the Growth phase the SaaS vendor had to re-design their Deploy processes in order to scale to a growing number of customers. Once mass adoption was reached the deployment process was well established.

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Level 3: Process Elements

This section refines the level-2 process down one more level.

Create (C)

The *Create* process defines the future offering in the in terms of product, pricing, promotion, and placement. *Create* spans the definition, creation, analysis, assessment and release of a new product or service. Typical practices are creating a business case, defining a Go-to-Market strategy, setting a price, identifying target markets, and defining requirements for product development.

- *Established Create* (C1) is a plan-driven routine process. Its output is fairly predictable: An offering to well-understood markets using known channels for sales and distribution and only marginal changes to pricing. As customers are familiar with the product there is no need to develop a new value proposition. The existing processes for creating the product, for positioning, pricing, and promoting should work best. C1 typically applies to refreshing products already in adoption, which are continuously improved through incremental innovation.
- *Adjacent Create* (C2) assumes that the process for creating the innovation is not established, but generally understood. There is a need to acquire new knowledge and correspondingly adjust existing procedures. This carries a higher level of complexity. *Adjacent Create* moves one or two steps away from a company's established *Create* process. The company needs to make a one-time effort, effectively setting up a project. C2 applies to innovations, which address either new markets or address existing markets with a substantially new offering in terms of the 4 Ps.
- *Disruptive Create* (C3) is a highly complex process. During product creation, even the expected outcome may be a moving target. The specific process steps are not known up front and need to be defined. They are likely to be adjusted in the course of C3. A typical scenario is an iterative cycling through prototypes which receive feedback of potential buyers. C3 has a high risk of failure.

Create starts with the qualification of ideas (Cx.1), ("idea funnel"), evaluations from user-based innovation[23], ideas out of a Blue Ocean strategy[24], or collaborative crowd-sourcing. Cx.1 creates qualified ideas, which are submitted to Plan (P). Plan determines whether a qualified idea fits into the portfolio and should be pursued. Cx.3 plans and schedules all subsequent *Create* activities. In case of a *disruptive Create*, a separate organization or new business processes may be setup (C3.2) beforehand.

Acquiring detailed market knowledge (Cx.4) is necessary for the *adjacent* and *disruptive Create* process. *Established Create* assumes that this knowledge already exists and therefore skips this step. Product requirements are collected in Cx.5. They need to be validated with the right customers, ensuring that the assumptions regarding pricing, positioning, and placement are correct. Cx.5 also integrates the specs for pricing, positioning and placement (Cx.6 – Cx.8) into a consistent whole. Process steps Cx9 – Cx.12 develop the product based on these requirements and specifications. Many companies have specialized departments and service providers for the development steps: A product development department for Cx.9, a supply chain management department for Cx.12, and an advertising agency for Cx11. Here are best practice examples from the consumer industry for Cx.11 "Develop and ensure quality of positioning concept":

- Trade channel management: A company defines channels and how to plan and interact with trade partners
- Defining brands
- Defining, planning, and setting up consumer channels
- Defining formats of customer engagement

[23] See [13]
[24] See [14]

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- Defining categories or integrating the product into an existing category management

The Create process ends with releasing the product to the market (Cx.13).

C1 Established	C2 Adjacent	C3 Disruptive
C1.1 Qualify Ideas	C2.1 Qualify Ideas	C3.1 Qualify Ideas
		C3.2 Setup Create process & organization
C1.3 Schedule Create activities	C2.3 Schedule Create activities	C3.3 Schedule Create activities
	C2.4 Acquire detailed market knowledge	C3.4 Acquire detailed market knowledge
C1.5 Collect product requirements and validate feasibility and compliance	C2.5 Collect product requirements and validate feasibility and compliance	C3.5 Collect product requirements and validate feasibility and compliance
C1.6 Specify pricing and packaging and validate profitability against assumptions	C2.6 Specify pricing and packaging and validate profitability against assumptions	C3.6 Specify pricing and packaging and validate profitability against assumptions
C1.7 Specify and validate positioning and messaging	C2.7 Specify and validate positioning and messaging	C3.7 Specify and validate positioning and messaging
C1.8 Specify and validate placement and customer engagement model	C2.8 Specify and validate placement and customer engagement model	C3.8 Specify and validate placement and customer engagement model
C1.9 Develop and test product	C2.9 Develop and test product	C3.9 Develop and test product
C1.10 Develop Pricing	C2.10 Develop Pricing	C3.10 Develop Pricing
C1.11 Develop and ensure quality of positioning concept	C2.11 Develop and ensure quality of positioning concept	C3.11 Develop and ensure quality of positioning concept
C1.12 Develop and ensure quality of placement concept	C2.12 Develop and ensure quality of placement concept	C3.12 Develop and ensure quality of placement concept
C1.13 Release product to market	C2.13 Release product to market	C3.13 Release product to market

Table 8: List of Create processes

Go-to-Market

The purpose of the *Go-to-Market* (G) process is to communicate the product value to the market, effectively convincing potential users and buyers to acquire the product. This process executes the positioning and promotion concepts defined in Create (C). The process ends when customers buy the product. The last step (Gx.8 Contract users) is managing the sales pipeline and contracting buyers. Go-to-Market also applies to free products like Linux, even though there is no purchase by a customer. For free products "Contract users" simply means that users agree to apply the product to their needs.

In multinational companies the *Create* process is often performed in a central location, such as the corporate headquarter, a development center, a specific advertising agency, or a research lab. In contrast, the *Go-to-Market* process is mostly executed by local or regional units: Sales offices, regional headquarters, and regional marketing units.

Go-to-market activities often are executed for a whole product group at once. Examples in the consumer industry are brand management and category management where activities are

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collectively executed for all products of a brand or category. Target groups for such activities can be the entire population of a region or highly fragmented customer segments in terms of geography, demography, etc., E.g., when using techniques from Micromarketing or Micro-targeting.

If *Go-to-Market* takes a wholly new approach, far beyond the tried and tested, the process is called disruptive (G3). An example is the first iPod, which wasn't just a gadget but a channel to sell music through an online-store and at a standard price. Disruptive *Go-to-Market* requires setting up a new organization or at least defining new procedures (G3.1).

Non-disruptive processes begin with scheduling the Go-to-Market activities (Gx.2). The price, which has been defined in *Create*, is the published (Gx.3). Prices may vary by market segment and the pricelist often is published at different points in time in different countries.

Adjacent or *disruptive Go-to-Market* apply when the chosen market is unknown to sales and marketing people. They need to learn about the market before starting to market or sell. Process element Gx.4 educates them on the market. *Adjacent* or *disruptive Go-to-Market* also may require rolling-out new sales channels and other promotional structures like a new eco system in sales or a fresh approach towards working with trade partners (Gx.5).

Process Gx.6 communicates the value proposition both, internally and externally. Internally the sales and marketing teams need to learn about the new product's value proposition, its features and functions. Next, they communicate the value proposition to the market. Depending on the industry this includes marketing campaigns, advertising, or hosting conferences for potential buyers. Gx.6 encompasses all activities, which stir interest in the target group.

Process Gx.7 generates and matures leads. Its output is a list of potential buyers who expressed some interest. This is input to the sales pipeline. The sales process Gx.8 converts the leads into buyers or – to be more precise – sales opportunities into deals.

G1 Established	G2 Adjacent	G3 Disruptive
		G3.1 Setup Go-to-Market process & organization
G1.2 Schedule Go-to-Market activities	G2.2 Schedule Go-to-Market activities	G3.2 Schedule Go-to-Market activities
G1.3 Publish Pricelist	G2.3 Publish Pricelist	G3.3 Publish Pricelist
	G2.4 Transfer Market knowledge	G3.4 Transfer Market knowledge
	G2.5 Rollout sales channels & other promotion structures	G3.5 Rollout sales channels & other promotion structures
G1.6 Communicate Value Proposition	G2.6 Communicate Value Proposition	G3.6 Communicate Value Proposition
G1.7 Generate & Mature Leads	G2.7 Generate & Mature Leads	G3.7 Generate & Mature Leads
G1.8 Contract users	G2.8 Contract users	G3.8 Contract users

Table 9: List of Go-to-Market processes

Deploy (D)

Deploy (D) turns a sales success into customer value. It gets the product into the hands of the buyer who consumes it and may finally volunteer as a reference.

For a highly disruptive *Deploy* process it is often necessary to setup a separate support or distribution organization, or define new processes (D3.1).

In the early 2000s this was the case for on-Demand business applications. Traditional on-Premise applications required that customers thoroughly tested the software for their individual

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configurations before starting productive use. On-Demand applications are already in productive mode and quality needs to be ensured in different ways. Software vendors had to re-think their delivery model and define new deploy processes.

An established or adjacent *Deploy* process begins with scheduling the corresponding activities (Dx.2). Adjacent or disruptive *Deploy* processes may need to establish a new model for customer delivery or support (Dx.3). If the innovation addresses a new market the internal and external teams in deployment, customer support, installation, and customization services need to gain sufficient market knowledge to understand customers and their problems (Dx.4). In any case they need to learn about the new product (Dx.5).

The product now gets into the hands of the users (Dx.6). This can take many forms: Physically deliver the product to the customer or a retail location, grant access to a network, download for digital media content, or utility services.

Some products such as heavy machinery or software products need to be installed or customized before they are functional (Dx.8). This includes first usage and rollout. From a user perspective, a lengthy customization delays the start of his productive usage. This makes the process quite relevant.

In industries like aerospace and defense or complex machinery, it is crucial to win user references (Dx.9) in order to reach the next stage towards adoption.

D1 Established	D2 Adjacent	D3 Disruptive
		D3.1 Setup Deploy process and organization
D1.2 Schedule Deploy activities	D2.2 Schedule Deploy activities	D3.2 Schedule Deploy activities
	D2.3 Establish customer support model	D3.3 Establish customer support model
	D2.4 Transfer Market knowledge	D3.4 Transfer Market knowledge
D1.5 Transfer Product Knowledge	D2.5 Transfer Product Knowledge	D3.5 Transfer Product Knowledge
D1.6 Make product available to users	D2.6 Make product available to users	D3.6 Make product available to users
D1.7 Customize and Rollout Product	D2.7 Customize and Rollout Product	D3.7 Customize and Rollout Product
D1.8 Win user references	D2.8 Win user references	D3.8 Win user references

Table 10: List of Deploy processes

Plan (P)

Outcome of the planning process is a portfolio of existing and future products needed for the overall product and innovation strategy.[25] *Plan Product Portfolio (P1)* determines what products will be created, rolled out, sold, and deployed in what markets. It aligns plans for *Create, Go-to-Market,* and *Deploy*.

[25] Defining the innovation strategy is out of scope for PLCOR. PLCOR takes an existing innovation strategy as input.

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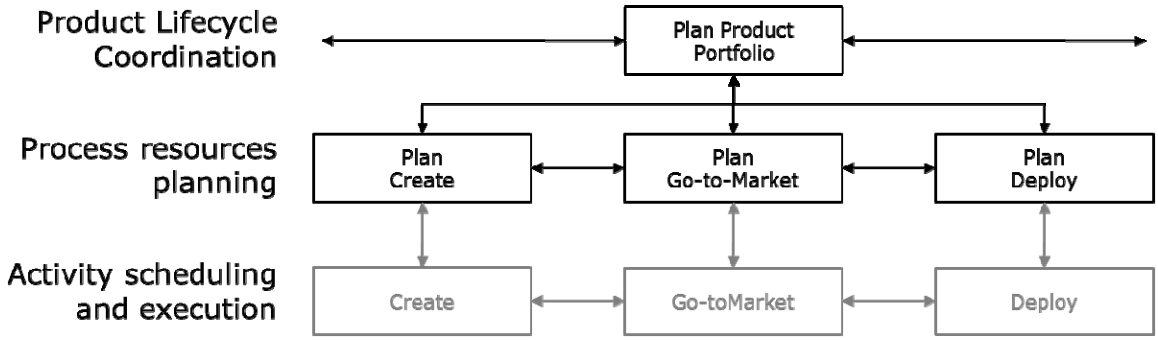

Figure 8: Plan Processes

Plan Product Portfolio includes managing the overall innovation and product management budget and is often done yearly with quarterly reviews. *Plan Create, Plan Go-to-Market,* and *Plan Deploy* determine the product portfolios for creation, Go-to-Market, and deployment. Plans for Go-to-market and deployment are often broken down by geographies or industries, e.g. the sales and marketing portfolio for a specific region.

P1 Plan Product Portfolio	P2 Plan Create	P3 Plan Go-to-Market	P4 Plan Deploy
P1.1 Identify and aggregate market opportunities from existing and future offerings	P2.1 Identify and aggregate Create requirements	P3.1 Identify and aggregate Go-to-Market requirements	P4.1 Identify and aggregate Deploy requirements
P1.2 Identify and aggregate resources to capture market opportunities	P2.1 Identify and aggregate Create resources	P3.2 Identify and aggregate Go-to-Market resources	P4.2 Identify and aggregate Deploy resources
P1.3 Balance market opportunities against resource constraints	P2.1 Balance Create requirements vs. resources	P3.3 Balance Go-to-Market requirements vs. resources	P4.3 Balance Deploy requirements vs. resources
P1.4 Establish & communicate Portfolio Plan	P2.1 Establish & communicate Create Portfolio	P3.4 Establish & communicate Go-to-Market Portfolio	P4.4 Establish & communicate Deploy Portfolio

Table 11: List of Plan processes

In addition there is *Plan Revise* to plan the execution of the Revise process.

Process P1.1 receives its main input from three sources:

- Qualified ideas from *Create (Cx.1)*
- Market information from internal and external sources such as sales data, analyst opinions and market feedback from *Revise (R)*
- A product and innovation strategy from strategic planning (not part of PLCOR)

Process P1.1 aggregates or splits qualified ideas into business cases in order to make them comparable.

Processes P2.1, P3.1, P4.1 receive the same input as P1.1 plus the portfolio decision from P1.4.

Process Px.2 aggregates internal resources and external resources, which are available for Innovation and Product Lifecycle operations: Product management departments, marketing

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departments, the eco-system, etc. The portfolio decision is taken in process Px.3 and communicated through process Px.4.

Revise (R)

The *Revise* process collects and channels all market feedback. Feedback can be positive or negative. It can come from all kinds of internal and external stakeholders: Customers and users, employees, analysts, the press, research, and government institutions. Feedback can result from tests and evaluations, a complaint, a critique, or an idea for improvement of the product or the innovation processes.

The *Revise* process receives the feedback, categorizes it by its nature (E.g., product complaint by a customer, positive analyst report), and channels it as input to the appropriate process.

Enable: Management Processes for Plan, Create, Go-to-Market, Deploy, and Revise

The *Enable* processes form five process groups associated with level-2 processes *Plan, Create, Go-to-Market, Deploy,* and *Revise*. They serve three types of objectives:

1. Manage process performance
2. Manage process control data
3. Manage process relationships

A list of enablement processes is provided below.

EP Enable Plan	EC Enable Create	EG Enable Go-to-Market	ED Enable Deploy
EP.1 Establish and manage business rules for PLAN	EC.1 Establish and manage business rules for Create	EG.1 Establish and manage business rules for Go-to-Market	ED.1 Establish and manage business rules for Deploy
EP.2 Manage PLAN Performance	EC.2 Manage Create Performance	EG.2 Manage Go-to-Market Performance	ED.2 Manage Deploy Performance
EP.3 Manage PLAN Data	EC.3 Manage Create Data	EG.3 Manage Go-to-Market Data	ED.3 Manage Deploy Data
EP.4 Manage Inventory of Ideas, Product Lifecycle and Roadmap	EC.4 Manage Inventory of Ideas, Product Lifecycle and Roadmap		
EP.5 Manage Capital Assets	EC.5 Manage Capital Assets	EG.5 Manage Capital Assets	ED.5 Manage Capital Assets
EP.6 Manage Operations Knowledge Transfer	EC.6 Manage Operations Knowledge Transfer	EG.6 Manage Operations Knowledge Transfer	ED.6 Manage Operations Knowledge Transfer
EP.7 Manage Eco-System for PLAN	EC.7 Manage Eco-System for CREATE	EG.7 Manage Eco-System for GO-TO-MARKET	ED.7 Manage Eco-System for DEPLOY
EP.8 Manage regulatory compliance	EC.8 Manage regulatory compliance	EG.8 Manage regulatory compliance	ED.8 Manage regulatory compliance
EP.9 Manage risk	EC.9 Manage risk	EG.9 Manage risk	ED.9 Manage risk
EP.10 Manage intellectual property	EC.10 Manage intellectual property	EG.10 Manage intellectual property	ED.10 Manage intellectual property

Table 72: List of Enable Processes

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Summary

The PLCOR model serves as a process reference for marketing and innovation management. It defines 5 distinct processes *Plan, Create, Go-to-Market, Deploy,* and *Revise*. The model supports incremental, semi-radical, and radical innovations. The more radical the innovation, the more disruption it brings to the processes. PLCOR groups the processes *Create, Go-to-Market,* and *Deploy* into 3 categories *Established, Adjacent,* and *Disruptive*. The categories reflect the degree to which the existing process can support the innovation or needs to be designed along with it.

Along the process hierarchy PLCOR defines a hierarchy of metrics. Performance areas group these metrics and form the basis for systematic alignment.

At this point in time PLCOR goes through first validations in real-life environments. Next steps include integrating it into the existing reference models of the Supply Chain Council SCOR, DCOR, and CCOR.

About PLCOR

The current version of the PLCOR model (formerly xPLOR) can be downloaded for free at https://cw.sdn.sap.com/cw/docs/DOC-138187. The material presented on a webinar of the Supply Chain Council is available at https://cw.sdn.sap.com/cw/docs/DOC-124474.

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