

October 19, 2022

Pace Layers Models Collection

Introduction

Shearing layers

Shearing layers is a concept coined by architect Frank Duffy, which was later elaborated by Stewart Brand in his book, *How Buildings Learn: What Happens After They're Built* (Brand, 1994), and refers to buildings as composed of several layers of change.

The concept has been adopted by a number of technology vendors to also describe the different layers of systems within an organization.

https://en.wikipedia.org/wiki/Shearing_layers

Stewart Brand's original diagrams

Stewart Brand's original diagrams

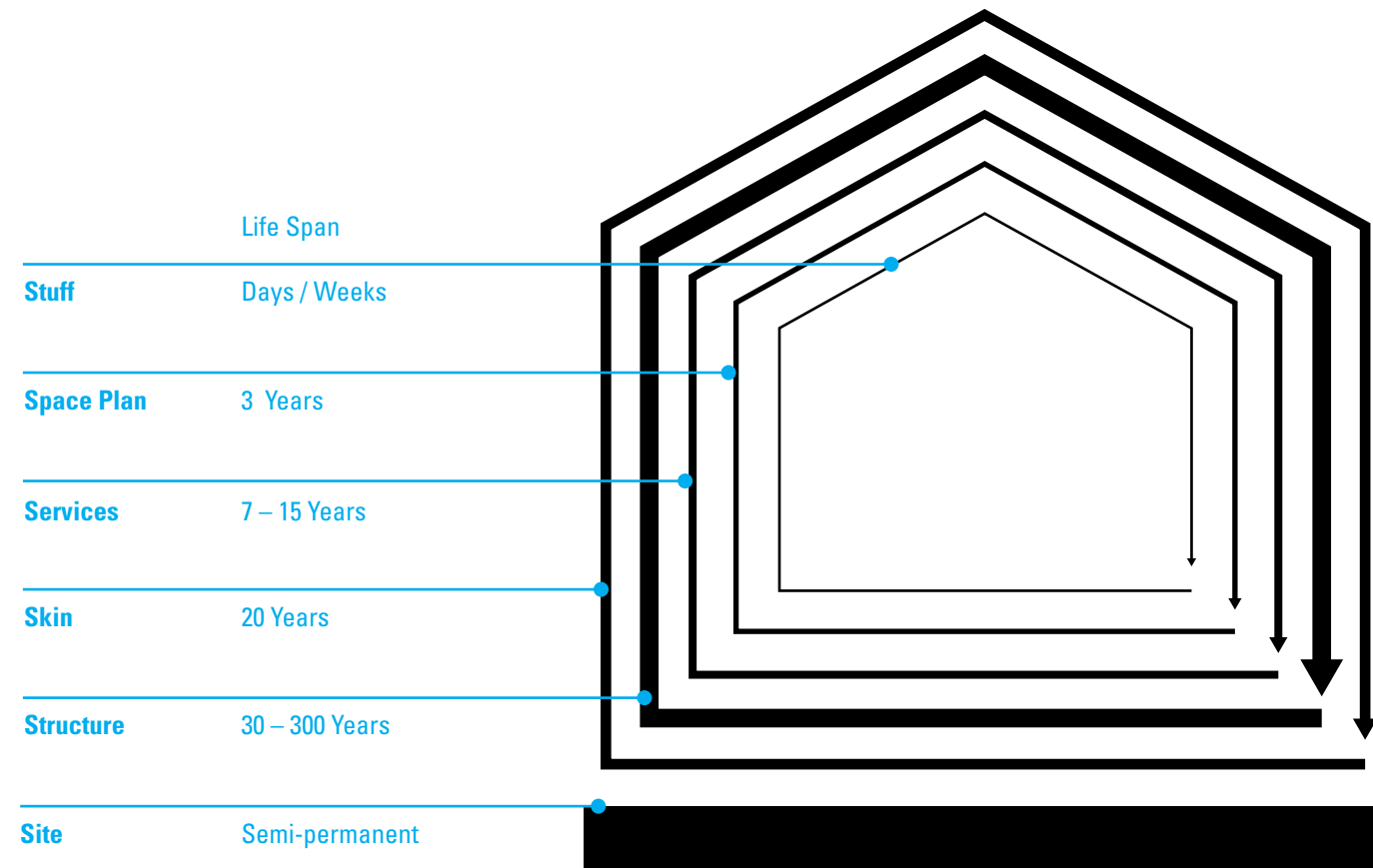
Shearing layers of change

Steward Brand

How Buildings Learn:

What Happens After They're Built, 1994

(Based on Frank Duffy's 'shearing layers'.)

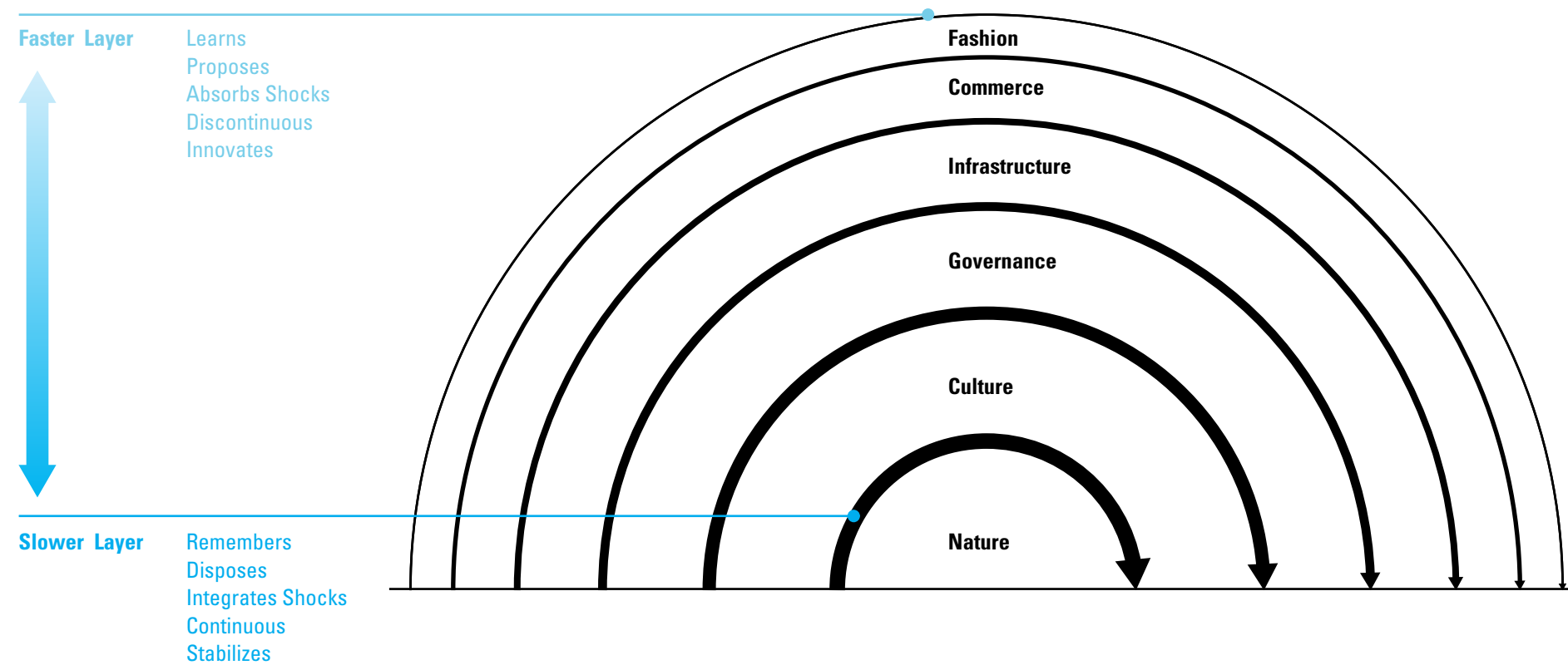


Pace layering — the six distinct time scales

Stewart Brand

The Clock of the Long Now:

Time and Responsibility, 1994



Gartner's Pace-Layered Application Strategy

Gartner's Pace-Layered Application Strategy

Attributes of Pace layers

	Paces of change	Life cycle	Planning horizon	Governance model	Stakeholders/ownership	Funding	Architecture	Application life cycle management approach
Systems of innovation (New ideas)	Rapid Very frequent Ad hoc Customization Weekly or daily	Short life cycle 0 – 12 months	Up to 6 months	Flexible Ad hoc	Moderate business executive engagement, with some sponsored and under-the-radar; tactical High end-user engagement, often through business users or even circumventing IT	Expense Innovation fund	Lightweight Emergent Predominantly service consumers Mobile and cloud-dominant	Waterfall: 10% IDD: 30% Agile & lean: 60%
Systems of differentiation (Better ideas)	Moderate More frequent Reconfigurability Every 3 – 6 months	Medium life cycle 1 – 3 years	1 – 3 years	Responsive Business-led	High business executive engagement, but driven by lines of business Moderate end-user engagement, with the business engaging on hot spots, and IT filling the gaps	Capital Expense Discretionary	Service-oriented architecture (SOA) and cloud-based, with a mix of service customers and producers Increasing use of composition applications through assembly of new and existing packaged and custom applications	Waterfall: 40% IDD: 50% Agile & lean: 10%
Systems of record (Common ideas)	Slow Infrequent Incremental Every 6 – 12 months	Long life cycle 10+ years	7+ years	Formal Global	High business executive engagement; alignment between business and IT strategy Low end-user engagement, and formal handover from the business to IT	Capital asset Annual budget	Large Modular design dominated by formal, upfront blueprinting phase	Waterfall: 70% Interactive and incremental development (IDD): 30% Agile & lean: 0%

Gartner's Pace-Layered Application Strategy

Governance Differences between the Layers

	Application portfolio management	Project and portfolio management	Staffing, skills, and sourcing	Financial analysis and budgets	Management of architecture	Software processes	Operations and support	Vendor management	Business engagement
Systems of innovation	Assess whether ready for production	Prioritize on Opportunity	Focus on Design of experiments	Venture-capital-style funding rounds	Experiment with new technologies and structures	Mostly agile	Team control with "kill switch"	Whatever works	Doing much of the work
Systems of differentiations	Assess whether still differentiating	Prioritize on Business strategic need	Focus on Business knowledge Business speed	Iterate on budget as project progresses	Leverage systems of record and new processes	Mostly incremental Iterative	Streamlined process per systems	Best of breed Business Process Management Solution (BPMS) Composite app	Day-to-day involvement
Systems of record	Assess cost Risk Business fit	Prioritize on Business needs ROI	Focus on Reliable Cost effective Delivery	Focus on Reliable Cost effective Delivery	Ensure Data integrity Process integrity	Mostly waterfall (time-boxed)	Tightly controlled change management	Large Stable Mega vendors	Formal processes

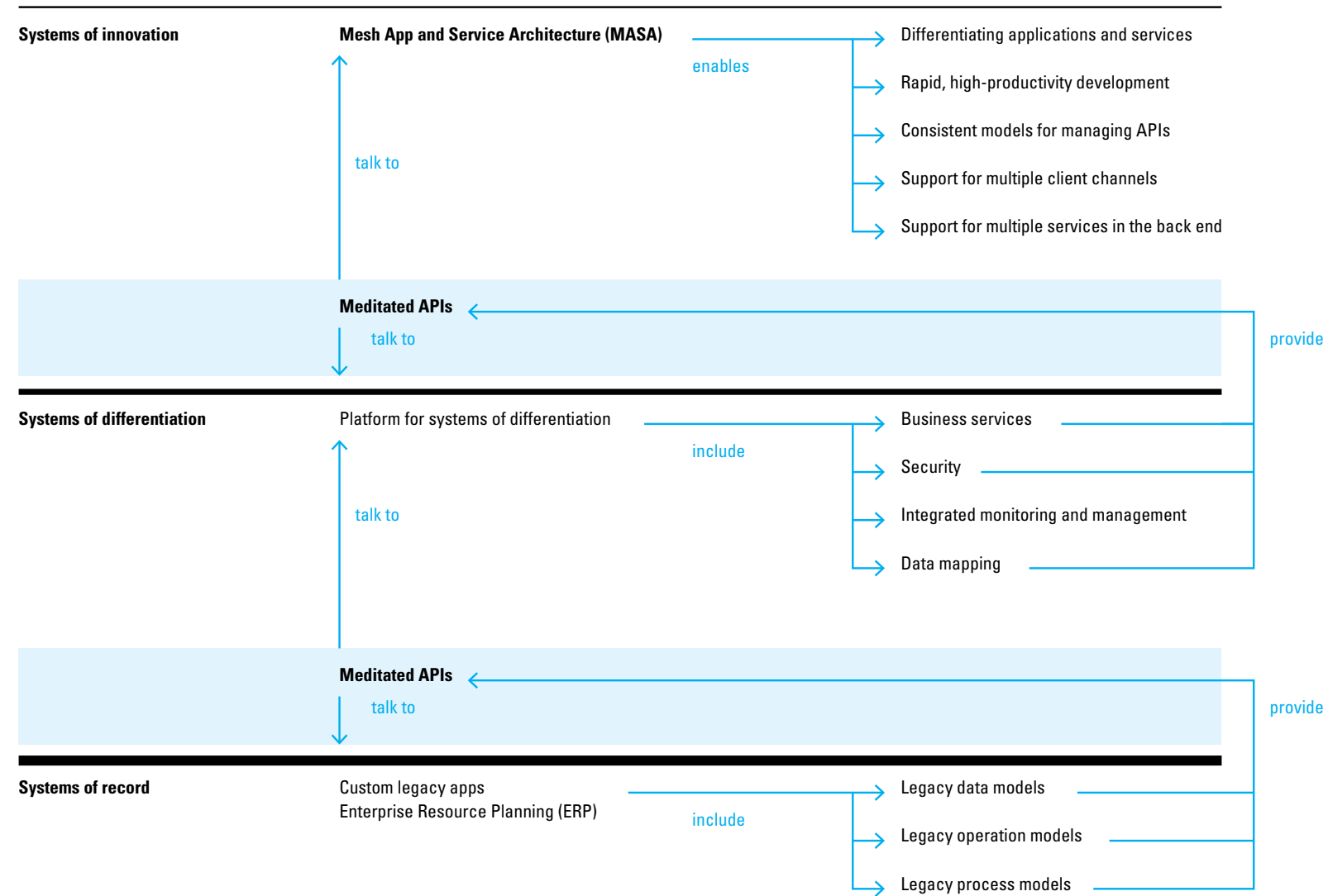
Types of Applications (Roughly categorized)

	Communication	Commerce	Analytics & Marketing	Management & Tools
Systems of innovation	Mobile SMS	Mobile E-commerce application	Location-based marketing	
	Mobile browser	Social commerce		
	Social community			
Systems of differentiation	Customer service	Commerce engine	Email campaign management	Web content management
	Personalization	Shopping cart	Site search and SEO	Catalog management
	Product configuration	Site merchandising	Multi-variable (A/B) testing	Promotion management
		Gift cards	Site monitoring	Image management
		Product reviews	Site analytics	Customer account management
		Content distribution	Web analytics	Store locator
		Guided selling	Reporting and Business Intelligence (BI)	Warranty>Returns management
		Cross sell/Up sell	Customer profile	Product visualization
		Product comparison		
	Systems of record			
				Financial applications
				Warehouse management
				Payment processing
				Alternative payment methods
				Fraud management
				Tax management
				Master data management
			Enterprise Resource and Planning (ERP) systems	



Gartner's Pace-Layered Application Strategy

A Differentiation Platform



Gartner's Pace-Layered Application Strategy

The Hub-and-Spoke Model

	Type	Features	Deliverables	Business value generation	Lifespan
Systems of innovation	Spoke is likely to be external	<p>Some data</p> <p>Business transformation capabilities focuses on business opportunities</p> <hr/> <p>Moderate data integrity mostly external, unstructured</p> <hr/> <p>Low process integrity dynamic, ad hoc</p>	<p>Innovative products & services experiment and explore new ideas that matches business strategies</p> <hr/> <p>Scenario models</p> <hr/> <p>Social database</p> <hr/> <p>E.g. Facebook campaign</p> <hr/> <p>Prospect web visit</p>	High	6 months – 3 years
Systems of differentiation	Spoke is mostly embedded in systems of record	<p>Data + process</p> <p>Differentiating capabilities are critical enablers of the business strategies</p> <hr/> <p>Relatively high data integrity internal, external, structured, unstructured</p> <hr/> <p>Relatively high process integrity configurable, autonomous</p>	<p>Differentiating products & services provides more differentiating options for customers to choose from without adding sales cost</p> <hr/> <p>Budgeting</p> <hr/> <p>Planning</p> <hr/> <p>Forecasting</p> <hr/> <p>Direct marketing database</p> <hr/> <p>Sales interaction</p> <hr/> <p>Quotation</p> <hr/> <p>Order entry</p>	High	3 – 5 years
Systems of record	Hub may be totally in-house, external, or a combination of the two	<p>Connecting tissues enable interactions between pace layers</p> <hr/> <p>High data integrity internal, highly structured well-managed</p> <hr/> <p>High process integrity structured, repeatable</p>	<p>Standardized execution processes optimize cost efficiency and automate business processes</p> <hr/> <p>Master data management</p> <hr/> <p>Process and data integration</p> <hr/> <p>Business service repository</p> <hr/> <p>Integrated composition technology</p> <hr/> <p>Integrated monitoring and management</p> <hr/> <p>Audit & compliance</p> <hr/> <p>Reporting</p> <hr/> <p>Reconciliation</p> <hr/> <p>Shipping</p> <hr/> <p>Invoicing</p> <hr/> <p>Cash receipt</p>	Low	10 – 20 years

Gartner's Pace-Layered Application Strategy

The placement of financial applications in the three pace layers differ among differently-sized organizations.

	Applications	Mid-size B2B Product-Centric Company (2011)	Large Multinational Company (2011)	
Systems of innovation	Profitability modeling and optimization	Yes	Yes	
	Strategy management	Yes	Yes	
	Forecasting	Yes	Yes	
	Supplier E-invoicing		Yes	
	Debt and Investment management		Yes	
	XBRL-based management reporting		Yes	
Systems of differentiation	Supplier E-invoicing	Yes		
	Account payable invoice automation	Yes		
	Budgeting and planning	Yes	Yes	
	Financial and management reporting	Yes	Yes	
	Collection and deduction management	Yes	Yes	
	Travel booking		Yes	
	AP invoice automation		Yes	
	Risk management		Yes	
	In-house banking		Yes	
	Close management		Yes	
	Disclosure management		Yes	
	XBRL-based management reporting			
Systems of record	Travel and expense management	Yes		
	Accounts payable	Yes	Yes	
	Purchasing	Yes	Yes	
	Close management	Yes		
	Financial consolidation	Yes	Yes	
	General ledger / fixed asset	Yes	Yes	
	Treasury management	Yes		
	Disclosure management	Yes		
	Account receivable	Yes	Yes	
	Expense reimbursement		Yes	
	Bank/cash management		Yes	
	Project accounting	Yes	Yes	
		Supplier E-invoicing		
		In-house banking		

Gartner's Pace-Layered Application Strategy

There are different rates of adopting technologies based on organizational scales.

Applications	Mid-size B2B Product-Centric Company (2011)	Large Multinational Company (2011)
Systems of innovation		
Profitability modeling and optimization	Yes	Yes
Strategy management	Yes	Yes
Forecasting	Yes	Yes
Supplier E-invoicing		Yes
Debt and Investment management		Yes
XBRL-based management reporting		Yes
Systems of differentiation		
Supplier E-invoicing	Yes	
Account payable invoice automation	Yes	
Budgeting and planning	Yes	Yes
Financial and management reporting	Yes	Yes
Collection and deduction management	Yes	Yes
Travel booking		Yes
AP invoice automation		Yes
Risk management		Yes
In-house banking		Yes
Close management		Yes
Disclosure management		Yes
XBRL-based management reporting		
Systems of record		
Travel and expense management	Yes	
Accounts payable	Yes	Yes
Purchasing	Yes	Yes
Close management	Yes	
Financial consolidation	Yes	Yes
General ledger / fixed asset	Yes	Yes
Treasury management	Yes	
Disclosure management	Yes	
Account receivable	Yes	Yes
Expense reimbursement		Yes
Bank/cash management		Yes
Project accounting	Yes	Yes
Supplier E-invoicing		
In-house banking		

Gartner's Pace-Layered Application Strategy

Many of the applications are still placed in the same pace layers as they were in 2011.

	Applications	Mid-size B2B Product-Centric Company (2011)	Mid-size B2B Product-Centric Company (2016)	Large Multinational Company (2011)	Large Multinational Company (2016)
Systems of innovation	Profitability modeling and optimization	Yes	Yes	Yes	Yes
	Strategy management	Yes	Yes	Yes	Yes
	Forecasting	Yes	Yes	Yes	Yes
	Supplier E-invoicing			Yes	
	Debt and Investment management			Yes	Yes
	XBRL-based management reporting			Yes	
Systems of differentiation	Supplier E-invoicing	Yes			
	Account payable invoice automation	Yes			
	Budgeting and planning	Yes	Yes	Yes	Yes
	Financial and management reporting	Yes	Yes	Yes	Yes
	Collection and deduction management	Yes	Yes	Yes	Yes
	Travel booking			Yes	Yes
	AP invoice automation			Yes	
	Risk management			Yes	Yes
	In-house banking			Yes	
	Close management			Yes	
	Disclosure management			Yes	
	XBRL-based management reporting				Yes
Systems of record	Travel and expense management	Yes	Yes		
	Accounts payable	Yes	Yes	Yes	Yes
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	Expense reimbursement			Yes	Yes
	Bank/cash management			Yes	Yes
	Project accounting	Yes	Yes	Yes	Yes
	Supplier E-invoicing		Yes		Yes
	In-house banking				Yes

Gartner's Pace-Layered Application Strategy

As time has passed, some of the applications have been commoditized and placed in the deeper pace layers.

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Systems of innovation	Profitability modeling and optimization	Yes	Yes	Yes	Yes
	Strategy management	Yes	Yes	Yes	Yes
	Forecasting	Yes	Yes	Yes	Yes
	Supplier E-invoicing			Yes	
	Debt and Investment management			Yes	Yes
	XBRL-based management reporting			Yes	
Systems of differentiation	Supplier E-invoicing	Yes			
	Account payable invoice automation	Yes			
	Budgeting and planning	Yes	Yes	Yes	Yes
	Financial and management reporting	Yes	Yes	Yes	Yes
	Collection and deduction management	Yes	Yes	Yes	Yes
	Travel booking			Yes	Yes
	AP invoice automation			Yes	
	Risk management			Yes	Yes
	In-house banking			Yes	
	Close management			Yes	
	Disclosure management			Yes	
	XBRL-based management reporting				Yes
Systems of record	Travel and expense management	Yes	Yes		
	Accounts payable	Yes	Yes	Yes	Yes
	Purchasing	Yes	Yes	Yes	Yes
	Close management	Yes	Yes		Yes
	Financial consolidation	Yes	Yes	Yes	Yes
	General ledger / fixed asset	Yes	Yes	Yes	Yes
	Treasury management	Yes	Yes		
	Disclosure management	Yes	Yes		Yes
	Account receivable	Yes	Yes	Yes	Yes
	Expense reimbursement			Yes	Yes
	Bank/cash management			Yes	Yes
	Project accounting	Yes	Yes	Yes	Yes
	Supplier E-invoicing		Yes		Yes
	In-house banking				Yes

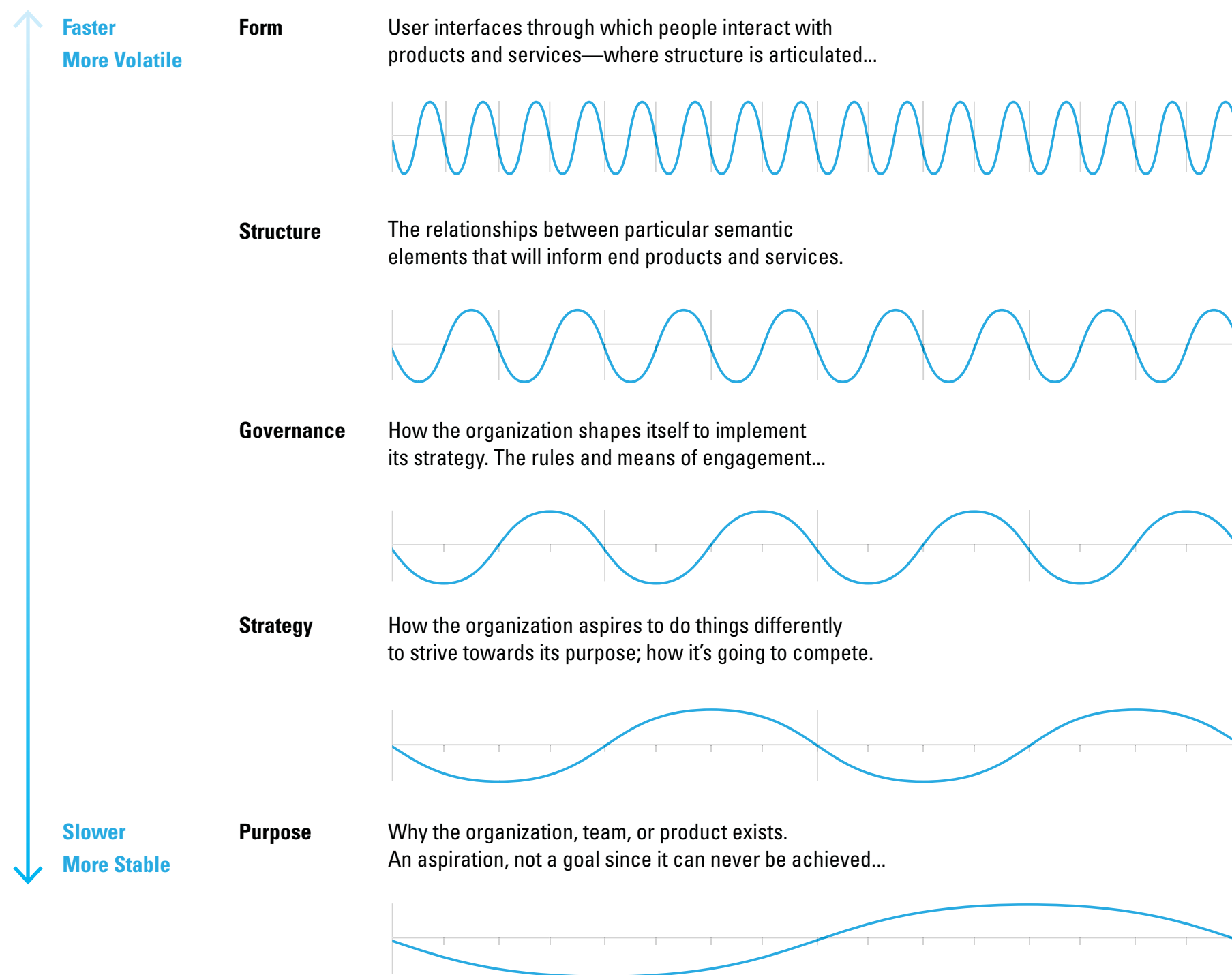
Examples

Pace layers in product management

Jorge Arango

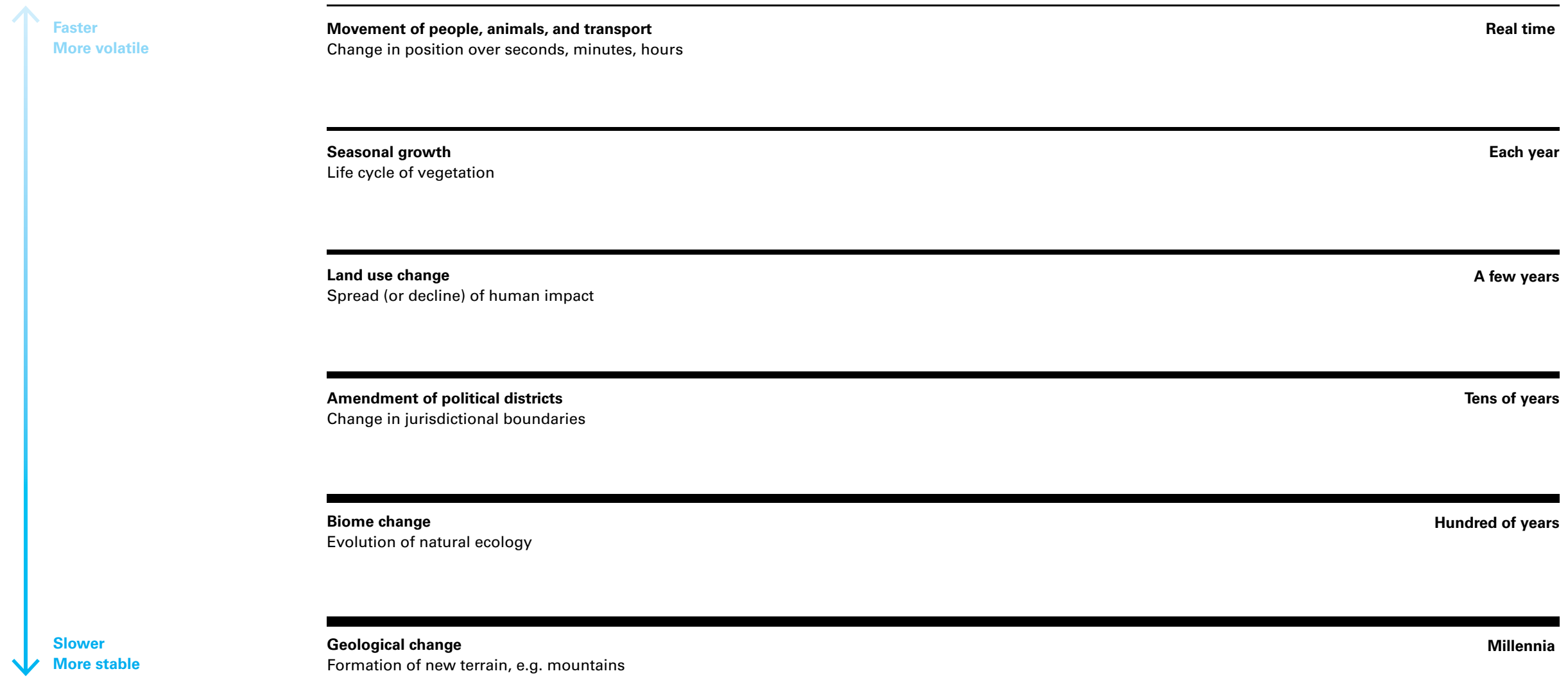
Living in Information:

Responsible Design for Digital Places, 2018



Designers tend to operate in these layers

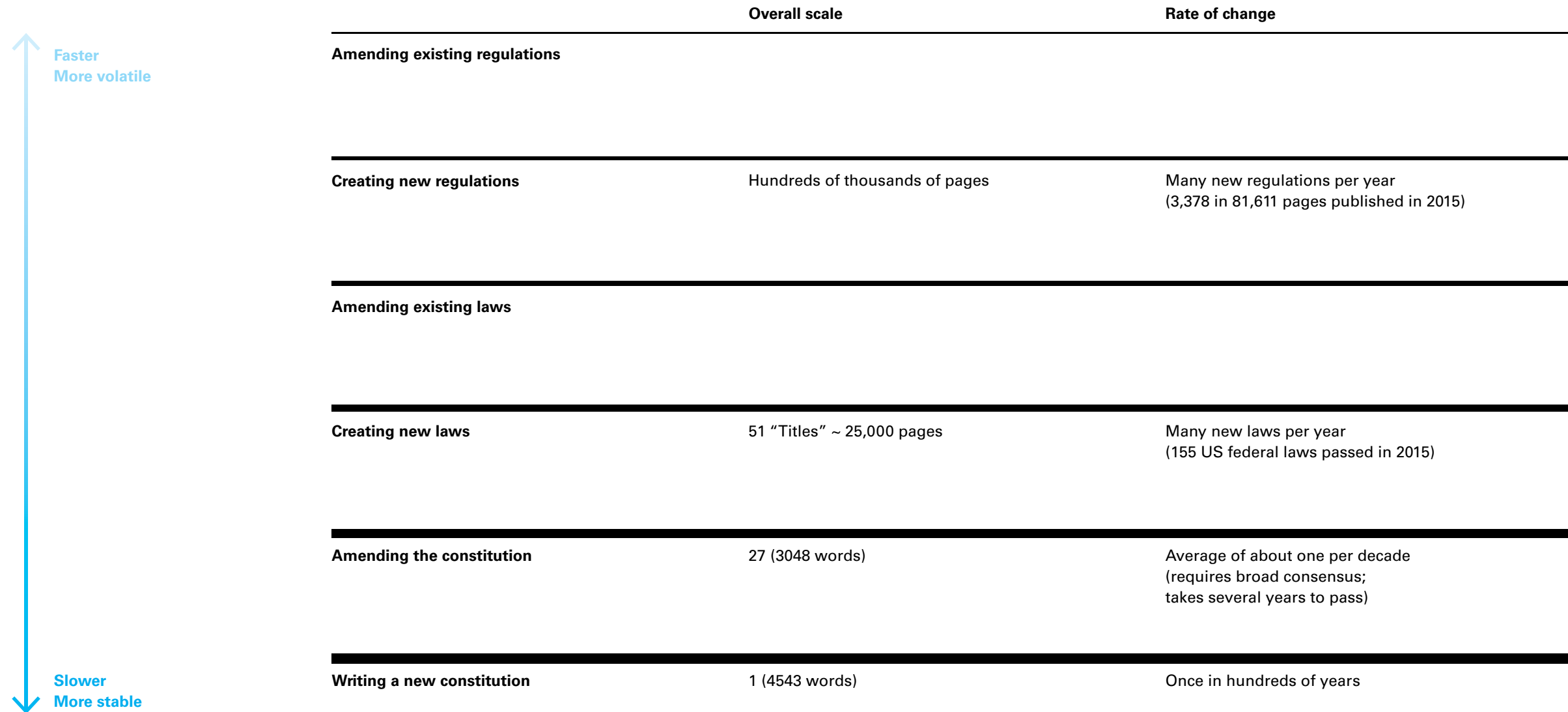
Pace layers in geo-spatial analysis



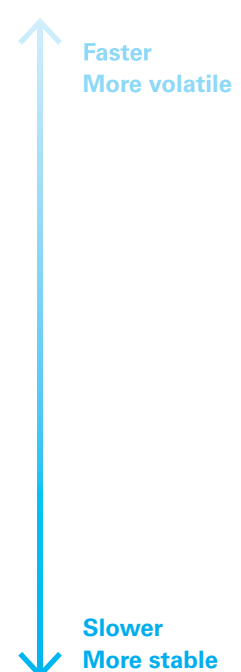
Pace layers in geo-spatial representation



Pace layers in governance



Pace layers in the U.S. federal system



	Members	Terms of office
House of Representatives	435	2 years
President	1	4 years
Senate	100	6 years
Current Authorized Federal Judges	874	Lifetime
Supreme Court Judges	9	Lifetime
Courts of Appeals Judges	179	Lifetime
Court of International Trade Judges	9	Lifetime
District Courts Judges	677	Lifetime

Pace layers in diabetes management

Dexcom CGM

Glucose measurement	Every 5 minutes
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Take insulin	1-3 times a day
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Change sensors	Every 10 days
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Calibrate sensor	1-2 times a month
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Insulin prescription	90 days
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Test A1C	90 days
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Change transmitter	90 days
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Eversense CGM

Glucose measurement	Every 5 minutes
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Calibrate sensor	1-2 times a day
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Take insulin	1-3 times a day
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Change sensors	Every 6 months
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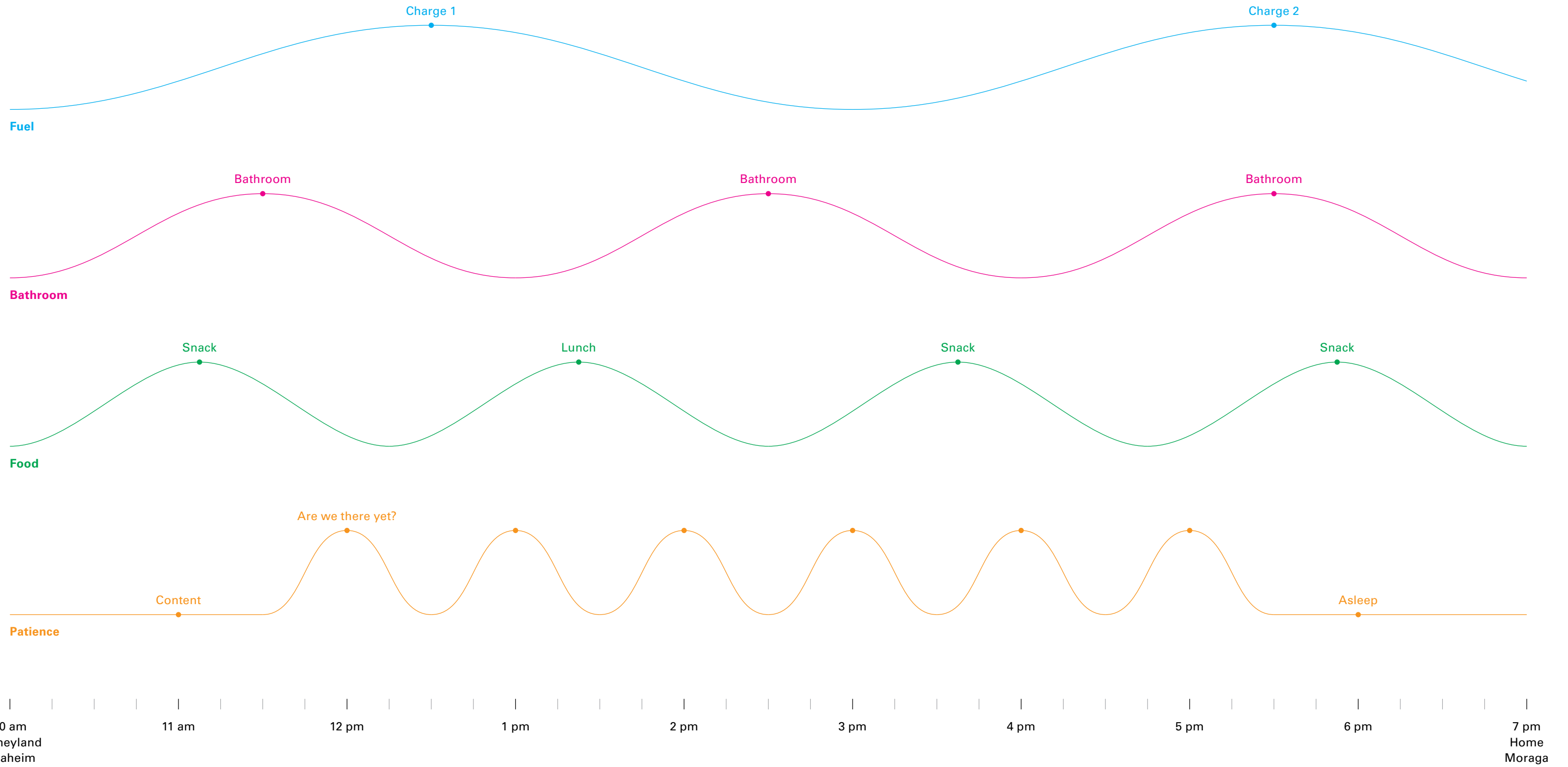
Insulin prescription	90 days
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Test A1C	90 days
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Change transmitter	1 year
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Travel

Pace layers in a trip to Disneyland



Pace layers in goal / means trees

Pace layers in goal / means trees

Goal / means tree of a non-profit organization

The means to achieve an organization's vision can be represented as a goal / means tree.

Create meaningful change in the US



Build a community of organizations



Create successful organizations

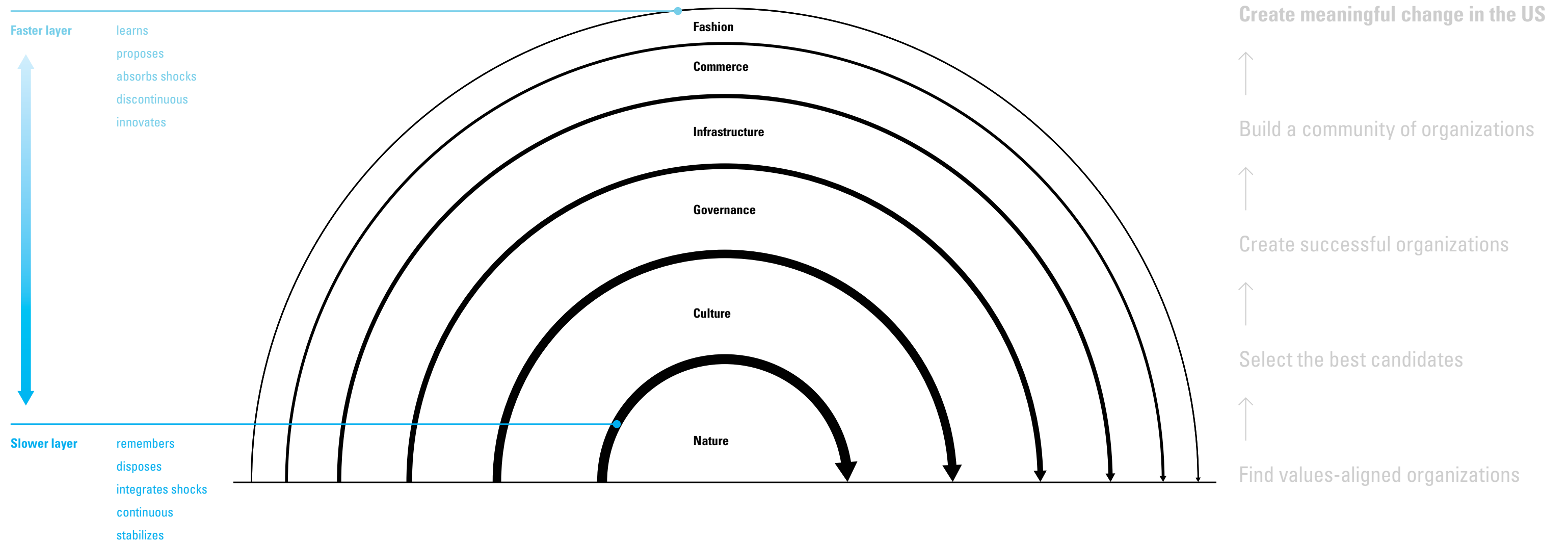


Select the best candidates

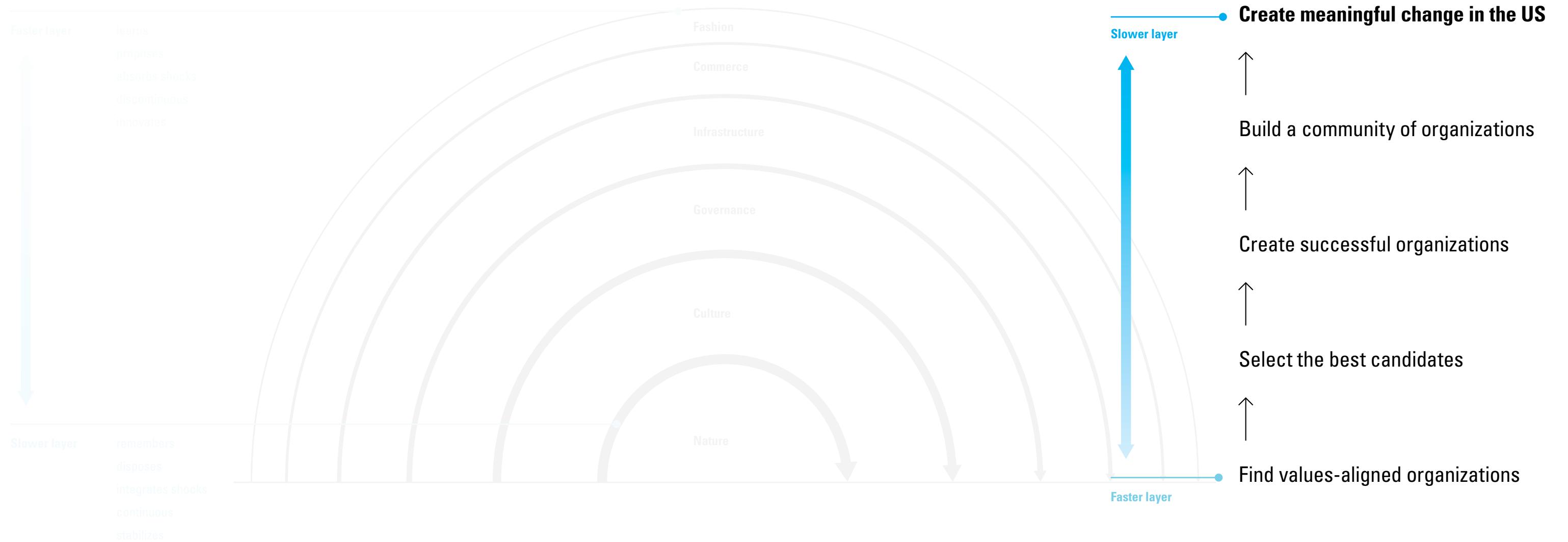


Find values-aligned organizations

Goal / means tree of a non-profit organization



Goal / means tree of a non-profit organization



Pace Layers Models

Collection

Dubberly Design Office