



WHITEPAPER

Digital Telco Transformation – Remaking Core Platforms to Enable a Digital Future



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Introduction

Communications Service Providers (CSPs) are at the forefront of a digital revolution, providing “anytime, anywhere, any device, any content” access to the connected world. But this leadership brings with it pressure to support an increasingly complex ecosystem of applications that task legacy BSS systems are ill-equipped to face.

The future will require CSPs to engage with their customers seamlessly across multiple channels; provide instant access to information from backend systems; apply insights from real-time analytics; and manage the security and privacy of customer data.

While digital technologies have evolved significantly, the constraints posed by traditional billing, ordering and provisioning systems remain a significant challenge. These systems are purpose-built for business siloes and, left alone, lack the flexibility needed to truly deliver next generation experiences.

What follows is a practical guide to how CSPs can flip this script and transform core elements of their platforms to meet the demands of a rapidly evolving digital world.

Trends Shaping the Future Reality for CSPs

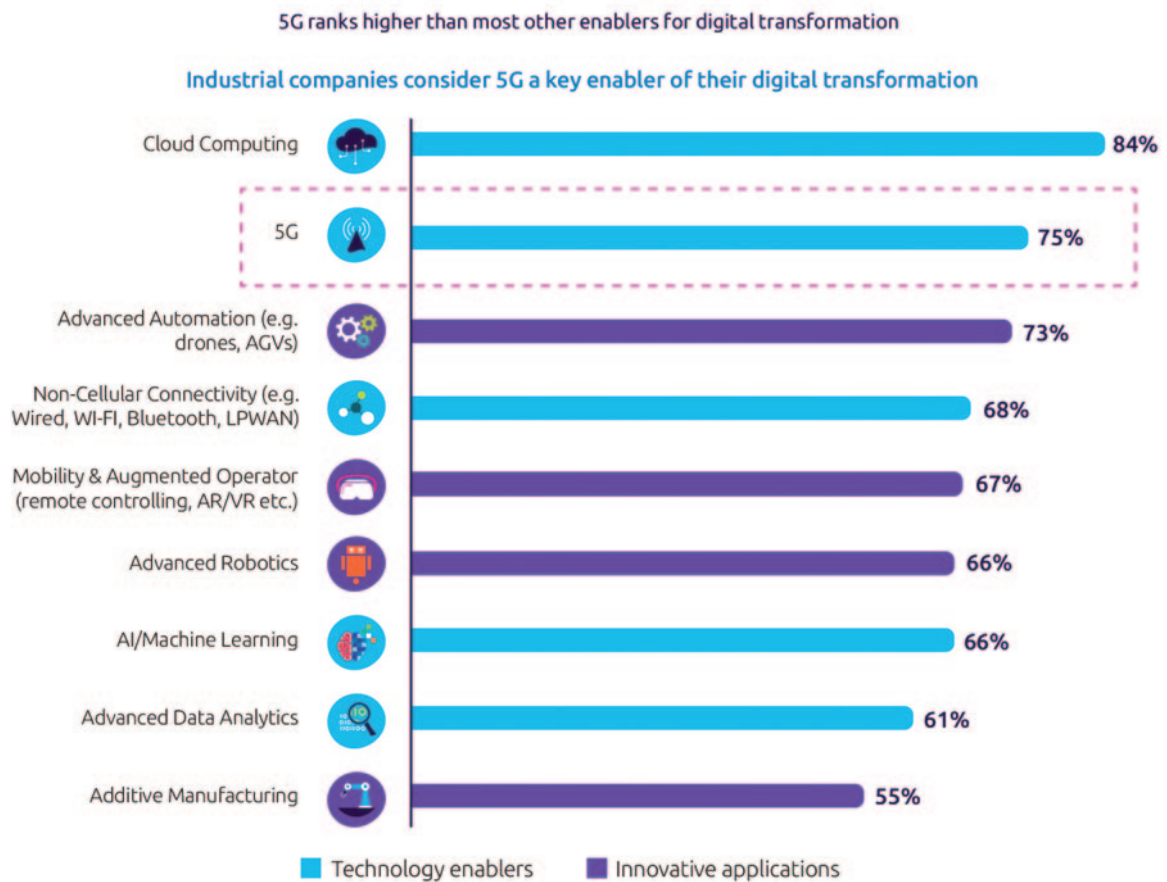
Even as the remnants of the 4G revolution continue to shape our world, 5G promises both new opportunity and new challenges. The potential for new business models and digital services is bright, but to capitalize CSPs must overcome slowing revenue trends and skyrocketing data demand which is driving a need to lower the cost to serve.

CSPs also need to adapt to a number of other trends, including continued digital convergence and heightened consumer expectations, all while building in enough flexibility to rapidly launch yet-unknown new services enabled by 5G.

A recent study by the Capgemini Research Institute, 5G in industrial operations: How telcos and industrial companies stand to benefit, revealed enterprises see 5G as one of the most transformative shifts on the horizon (See Figure 1).

New and enhanced consumer use cases are already emerging, with gaming and augmented and virtual reality leading the pack. But to maximize benefits from these and others that will come, CSPs must figure out how to truly be digital or else be relegated to the role of dumb pipe.

Figure 1: 5G ranks higher than most other enablers for digital transformation



Capgemini Research Institute, 5G in industrial operations: How telcos and industrial companies stand to benefit, June 2019

Definitions of Digital

So, what does it mean for a CSP to be truly digital?

For the purpose of this paper, the term “digital” for CSPs has two separate but related meanings:

- How CSPs interact with and service customers with highly reactive experiences across all channels and products/services.
- The architectures, technologies and software delivery lifecycles used to achieve modern customer experiences.

In addition, being digital is essentially not a constant state but an ongoing journey, and management of that transformation requires both the design of the digital technology-enabled capabilities needed and driving the change to realize their potential, which often means new skills, talent, leadership and culture.

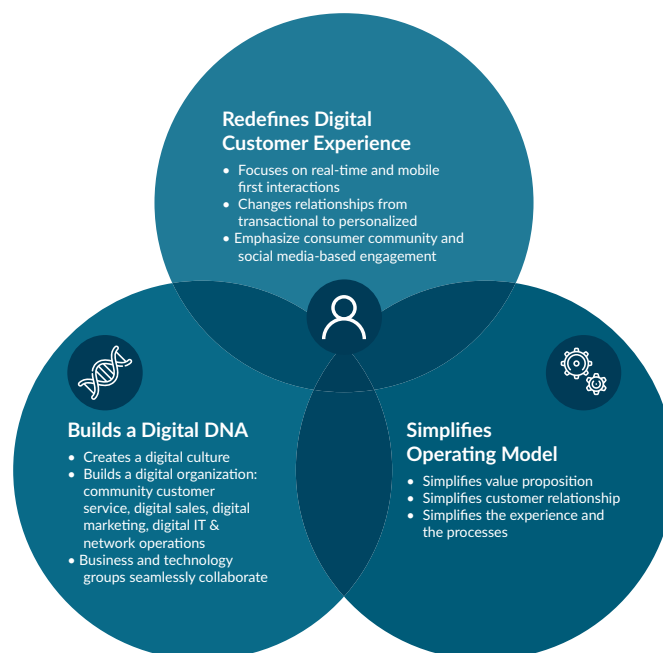
Before jumping into capabilities and technical requirements, it is important to understand the demands of today’s digital customer experience and the drivers influencing the necessary architectures, technologies and software delivery lifecycles in both the consumer and enterprise markets.

Digital Customer Experience

Digital-native players such as Google, Spotify, Facebook and Amazon have clearly defined a new standard for customer experiences. Key characteristics and principles include:

- Disruptive and continuously enriched offerings, with new features to create stickiness.
- Intuitive designs, with a friendly UX and the ability to complete even complex tasks in just a few clicks.
- Anytime, anywhere, any device capabilities.
- Simple, transparent and non-binding offers with no hidden conditions or fees.
- Personalized and contextual engagement.
- Flexibility and control over engagement.

Today, CSPs struggle to meet those standards, and suffer poor brand perception as a result. A Capgemini Research Institute report, *Unlocking Customer Satisfaction: Why Digital Holds the Key for Telcos*, found half of mobile operators had a negative Net Promoter Score, reflecting dissatisfaction in six of nine countries studied.



Source: Capgemini Research Institute, *Unlocking Customer Satisfaction: Why Digital Holds the Key for Telcos*, February 2016



Making the Change

In order to deliver the powerful experiences consumers expect, CSPs need viable architectures, reliable technologies and repeatable delivery lifecycles. These three key elements rely and feed on each other, with the goal of making solutions modular to enable rapid ideation to realization.

Architecture sets shape to the solutions by providing patterns to distribute functions and laying critical cornerstones for performance, reliability and modularity. Technologies enable discrete functions and the broader architecture, while also providing opportunities for efficiencies in function, reliability and modularity. Finally, the delivery lifecycle offers the opportunity to inspect and adapt rapidly to keep or set the pace in the digital arms race, in tandem with a new way of working.

Why Legacy BSS Won't Work

CSPs historically achieved success by building robust and reliable infrastructure that included not only a delivery network, but also supporting software systems for selling their services, supporting customers and managing billing and revenue.

These systems offered reliability, scalability and efficiencies by creating structured and highly customized application stacks by line of business (LOB) and/or channel siloes, with each having its own mechanism for managing customer relationships, products, pricing, invoices, accounts receivable, etc.

This worked well in the days when various fixed and mobile services were sold separately, with no expectation of an integrated customer view.

But as digital convergence progressed, supporting customers in these siloed BSS systems became increasingly challenging.

Introducing any new processes to improve the customer experience within the various systems for sales, service and billing required very complex integrations with the legacy BSS systems, demanding specialized knowledge, careful coordination with downstream system owners and significant effort to perform regression testing.

Additionally, the technology limitations of these systems (typically built on older generation client-server technologies with limited availability of APIs) meant that integration often required expensive custom development, increasing the total cost of ownership and time to market.

Operationally, the excessive dependence on backend legacy BSS systems for customer facing applications resulted in lower productivity due to frequent downtimes and the need for complex procedures to avoid fallouts and order failures because of backend dependencies.

The recent emergence of technologies like IoT, SDN and NFV and new business models spanning connected commerce, telemedicine, smart cities, and more have brought a new sense of urgency to this issue. Today's technologies demand real-time access to customer data and the flexibility to implement changes with extremely rapid time to market.

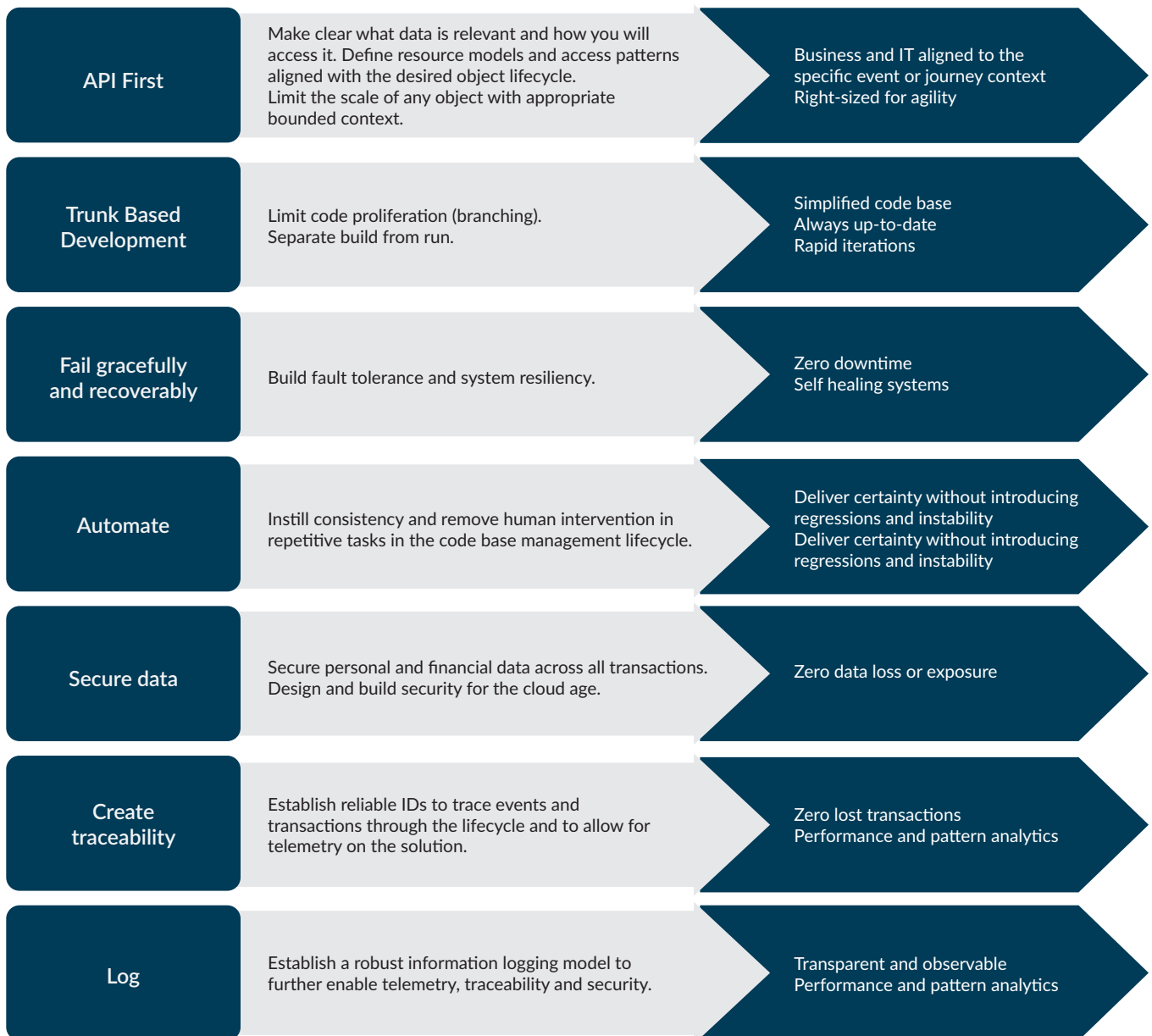
A New Digital Architecture

Adoption of a new digital architecture offers CSPs the opportunity to fix these problems and future-proof their systems. CSPs are taking their cues from the likes of Google to lay the right foundation and to apply best-in-class software engineering practices. Forged

from highly-agile companies with hyper-scale needs, these architectures are well suited to both the organization context and customer experience needs of modern CSPs.

There are a number of open, branded, and even proprietary models to build a digital architecture, ranging from the Twelve-Factor App and its derivatives to Google's Site Reliability Engineering. Each model centers on creating a reliable approach, either across the entire delivery lifecycle or a limited focus area, for software engineers to maintain the balance of modularity, functionality and resiliency in high-performing solutions.

Figure 3: Key digital architecture principles and benefits



These models include seven key principles, outlined in Figure 3 above:

While architectures do not prescribe specific technologies, they do emphasize the de-coupling of functions and the importance of selecting the optimal technology to deliver a defined function with desired characteristics. Stated another way, the architecture sets the context for the technology.

Digital Technology

The next step is to contextualize the selection of technology with the purpose placed on it in the architecture. This means clearly understanding the component's function and what operational characteristics it must provide to be successful:

- What is rigid and what is configurable?
- What are the necessary performance metrics?
- What reasonably predictable enhancements or extensions should it be prepared to accommodate?
- What failure, reduced services conditions or external dependencies should it be prepared to accommodate?
- What deployment conditions, such as disaster recovery, auto-scaling or zero downtime operations, should it be capable of accommodating?

CSPs should also consider how the broader context of business opportunities, principles, demands and preferences impact technology choices. Business context, like guidelines or policies on open source versus packaged or best-of-breed versus all-in-one, must impact digital technology selection. For instance, not every situation is open to bleeding-edge technology risks, which can come with rapidly evolving open source. At times, the decision simply comes down to the right price, at the right time, for a jumpstart solution.

There can be seemingly endless technology choices for something as simple as data management, but focusing on the target architecture and business context can help narrow the options. It is also critical to recognize that technology choices will evolve as quickly as your digital solution does, and there will be instances where your selection is a case of Mr. Right Now, instead of Mr. Right.

Digital Delivery

In Marvel's Agents of S.H.I.E.L.D., Dr. Whitehead often remarked "discovery requires experimentation". This

sentiment is a powerfully concise way to describe the hallmark of successful digital delivery.

Success requires CSPs to not only create a value proposition and develop an appropriate solution, but also to continually and rapidly adapt that solution based on measured results. A digital delivery model and way of working is needed, not only to deliver better and faster outcomes, but also to attract and develop digital talent and skill sets.

Digital delivery itself is a large topic. Key tenets to finding the right approach and target operating model include understanding:

- organizational drivers – Are you currently project or product driven?
- value propositions – Are you aiming for cost reduction, top line growth, maintaining position as a market leader, or setting the pace with leading trends in digital solutions?
- organizational change distance – Where are you today versus where you need to be with nimble delivery techniques and automation?
- What degree of change do you need in terms of existing skills and way of working?

Considering these tenets is only the first step in the transformation to digital delivery. Additional insights covering the remainder of the process will be provided in future Capgemini publications.



Models for Success

As CSPs look to transform their core operations, they have a wide variety of strategic options to choose from based on their digital goals.

Approach	Speed	Cost	Complexity	Future Ready
Full Digital Greenfield	Medium	High	Low	High
Focused Experience Dimension	High	Medium	Medium	High
Legacy Isolation	Medium	High	Low	Medium

**note this table is for illustration purposes to give broad context to our analysis.*

Choosing option and designing the corresponding transformation journey, depends on both the current state of their digital technologies and the strategic approach a CSP wants to take to drive people and culture change. Below we will focus the discussion on the digital technology capability considerations.

Full Greenfield Digital Brand (FGDB)

The greenfield approach includes a full replacement of the legacy IT stack with new set of capabilities and potentially a new accompanying brand. This approach is good fit when business requires a completely new set of capabilities which existing legacy systems can't provide in a timely or efficient manner.

It can also help meet growing demand for new digital-only services. Research conducted by Capgemini found a majority of consumers want a "digital-only" telco, but only 2% of CSPs plan to deliver this into the market.

CSPs have the option to build from scratch, look for commercial off-the-shelf offerings, or take a best-of-breed approach which integrates components from various vendors. Where possible integration and customization should be limited to reduce implementation risks.

Real-world examples include:

Verizon

- First mover in the US to launch a full digital telco – app + web-based operator – commercialized under the brand name Visible since May 2018.
- Visible was built in a fully greenfield mode, on Salesforce, Vlocity and Matrixx solutions, using Vlocity OmniScript to power their digital frontends.

Orange Poland

- First Orange affiliate to launch a full digital telco – app-based operator – commercialized under the brand Orange Flex since May 2019 in a bid to address a new market segment and launch new services.
- Built in a fully greenfield mode, on Salesforce, Vlocity and Matrixx solutions, using react native framework for its frontends.

Focused Experience Dimension (FED)

Instead of wholesale change, a FED approach includes a calculated focus on a narrower experience or process domain within the legacy stacks to help introduce flexibility to rigid systems and meet immediate needs while more slowly moving toward a target end-to-end digital architecture.

A typical FED transformation focuses on revamping the customer interaction and engagement layer, while continuing to use legacy backend applications for stability and reduced business impact. This approach should be informed by customer data and feedback, with a focus on a shorter delivery timeline and experimentation.

In setting a FED strategy, standards conformance and alignment are required, as well as a step-by-step plan to acquire new capabilities through multiple transition architectures so that future enhancements to the BSS/OSS stack can be done smoothly, and the same stack can be reused for multiple lines of businesses.

Examples include:

Telus Digital, Canada

- Established a Digital Organization and developed a comprehensive IT delivery infrastructure for rapid delivery of customer facing use cases, including a site builder and repository of design principle, patterns, styles and pre-built components.
- Used an Open Source Platform (Telus Design System) to create Digital Customer Experience.
- Strong Artificial Intelligence and Predictive Analytics foundation.

Unnamed European operator

- Large mobile and fixed incumbent in Europe kicked-off a step-wise transformation journey to gradually digitize and automate the B2B business. Sub-projects were defined in the areas of Sales, Service, Delivery, etc.

- First step was a Sales Transformation: digitalization and improving the sales, quotation and contract management processes, supported by Salesforce and Vlocity. Achieving a 70% reduction of lead time from lead to quote.
- Partial/selected integrations to legacy solutions where necessary

Legacy Isolation through Digital Architecture (LIDA)

Legacy isolation is the practice of using digital integration architecture patterns and solutions to build an abstraction layer between modern, digital systems and classic systems of record. The goal is to isolate the core business driving features of the systems of record from other transactional processes, functions and data.

Many details from CSPs using this approach are not yet public. However, in Capgemini's experience, the process begins with enabling APIs to support high-volume transactions for core customer data and account management for self-service.

Certain details (MSISDN, email, address, party or account data) are extracted from long running order processes and account and billing management systems of record.

The supporting data is also pulled, leaving behind only the necessary operational data in the system of record. The final stage of isolation is to establish patterns for real-time resiliency with the new digital systems, as well as the transactional data layer and eventual consistency on an as-needed basis for operational data which must propagate to the systems of record.

Legacy isolation requires adherence to strong standards for addressing concepts like real-time resiliency and eventual consistency in data management. Additionally, it requires strong architecture patterns for segmenting transactional data and operational data and managing the flow between through proper patterns for real-time resiliency and eventual consistency.

Conclusion

A new generation of digital-native tech titans raised the bar for the customer experience, and consumer expectations are higher than ever. As CSPs look to transform core elements of their platforms to meet the demands of a rapidly evolving digital world, there are a number of models for success they can adopt.

The FGDB approach requires a broad commitment to both new platform implementation and potentially a new brand in the marketplace. However, by starting with a clean, off-the-shelf platform, the risk of failure or delay is greatly reduced. This strategy is most effective when combined with a focus on an untapped market segment.

FED is another avenue CSP's can take, offering a quick way to address specific processes or pain points. The drawback to this approach is that it does not necessarily address the underlying lack of flexibility in outdated legacy platforms. Thus, as new digital services and business models are brought online, the CSP's ability to react is limited.

The LIDA strategy can be relatively low-cost at the outset, depending on the technology selection and technical maturity of a CSP, thanks to the availability of open source design patterns that can be leveraged and quickly adapted for the CSP's environment. One of the great external benefits this strategy drives is increasing digital strengths in the CSP's technology organization. However, an initial lack of internal expertise can lead to a slower start.

Critically, all three approaches can be blended to address both short-term and long-term goals. CSP's can meet their most urgent transformation needs through LIDA and make short-term improvements to select experiences with a limited scope FED strategy, all while working toward the launch of a full greenfield digital brand.

The days of a one-size-fits-all transformation are long gone and new tools are at hand to help CSP's prepare for – and conquer – the digital future.

Ready to move beyond this introductory guide to take control of your digital future? Capgemini is here to help you shape a strategy and plan to achieve it.

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Source: Capgemini Research Institute, 5G in industrial operations: How telcos and industrial companies stand to benefit, June 2019
Source: Capgemini Research Institute, Unlocking Customer Satisfaction: Why Digital Holds the Key for Telcos, February 2016

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