FOR F2F meeting on 15-OCT-18

Lee's

Zone A – The Lens ← who to what

SCENARIO
A joint venture (JV) formed in 2007 between EE and H3G to achieve CAPEX and OPEX reduction through the economies of scale of passive infrastructure sharing, resulting in the creation of a ground breaking tower company.

In order to understand where MBNL wishes "to-be", the UK market they serve and the expectations placed on them from their shareholders; Amdocs has produced a journey map detailing impacts and milestones from date of formation to the current day.

GOALS AND EXPECTATIONS
Transformation of both Network Operations (OPS) and Operational Support Systems (OSS) to further Shareholder vision and strategy for network planning, design, build and operation while optimising operational efficiencies and decoupling ongoing operational expenditure from network growth, enabling both MBNL and Shareholder-Unilateral processes to coexist effectively. Become a World-Class TowerCo.

The map allows Amdocs to understand MBNL's goals and future looking aspirations based on both prior business decisions, market trends and technology evolution (2G → 5G).

This slide when shown in full, describes Amdocs view of what is required for MBNL to become a World-Class Tower Company.

chunkable phases of the journey

historical actions of both MBNL and shareholders

Zone B – The Experience

2G

- MNO rivals T-Mobile & H3G continue rollout of 2G across the UK to compete with Vodafone and O2

- innovators + early adopters fuel early mobile market with mobile telephony + wireless data.
- OPEX + CAPEX rocketing
- limited estates for towers

2.5G + 3G

- MBNL formed to deliver and operate 3G network
- MBNL GODIVA network integration milestone of 12,000 sites
- Following merger with T-Mobile, Orange join MBNL as Everything Everywhere (now known as EE)

- early majority tech adoption driving 3G
- Tower + estate consildation to aid competitive growth against VF + Cellnet (O2) – catch up

4G

- UK first 4G network launched under EE; EE & Three sign new network sharing agreement
- MBNL reaches 18k RAN sites and carries 75% UK mobile data traffic
- EE joins the BT group, Jan 2016

- late majority + laggards tech adoption as market proliferation has peaked
- SMS/voice traffic volumes reducing rapidly as data usage increases

5G

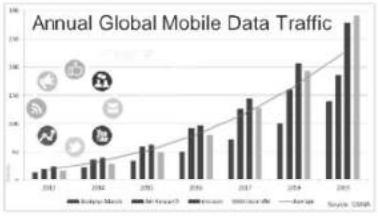
- UK 5G spectrum auction raises GBP £1,355,744,000
- 67% (£453,888,000) of UK 5G spectrum auction investment from EE and Three
- UK Government launches 5G Testbeds and Trials Programme (5GTT)

- investment in 5G spectrum is causing more MVNOs to sell off tower estates as the focus more on service and brand.
- Letting go of traditional tower management also allows trials with alternative infrastructure
  - Fibre in sewers / balloons

Thoughts
emotional experience through the journey

JV inherited monolithic, heavily customised OSS and overly complex shareholder-unilateral processes

- initial OSS was no doubt "best of bread" at the time of formation but had already been broken to support 3G over the initial 2G design

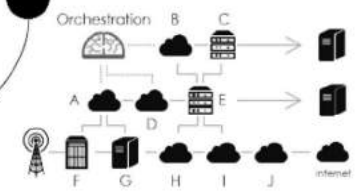


- voice/SMS drops in favour as network data speeds of 2.5G/3G and then 4G rural wired broadband speeds that was available to the majority of the population.
- mobile data revenue moves from low-volume+ high cost with 3G to high-volume+ low cost with 4G

2G networks expected to outlast 3G as MNOs jump to 4G

- NEPs switch to software controlled antennas, supporting "easy" upgrade path from 4G onwards thus meaning 3G is dead technology and reinforcing the rural reach of 2G
- MNOs focus on the rewards of 4G+ and write off 3G

vRAN/vEPC/vIMS usage soars due to increase of NFVI



- [shareholders] from explosion of popularity of virtualisation from IT, MNOs now expect the network to operate at "software speeds".
- Virtualising EPC, IMS provide immediate benefits (time to market) for rolling out 4G through dynamic scaling and greater agility
- virtual RAN follows virtualising; the radio network functions and is seen as a "stepping stone" enabler for the emerging needs of 5G and beyond

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Connected "Things" drive need for capacity & coverage

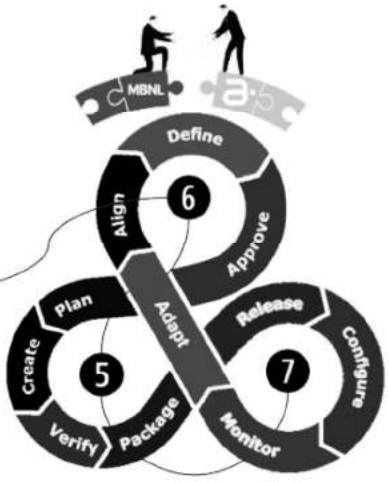
IoT M2M

- IOT - connecting BILLIONS of devices to the Internet + open networks
  - > smart meters
  - > cars + fleets
  - > logistics
  - > on person devices ie watch / fitness track
- M2M
  - > security
  - > traffic control
  - > robotics
  - > vending machines
  - > billing
  - > telemedicine
  - + closed network

5G Readiness

- MNOs evaluate 5G needs
  - MBH capacity / latency / reach
  - core capacity / slicing orchestration
  - spectrum: type (MHz) + availability
  - ROI + business cases

- Hardy RFP process



- SP5 OSS Build – Paul/Lee
- SP6 Run and Maintain – Andy
- SP7 OSS Enhance – Paul/Lee
- DevOps delivery – Anand

- MBNL emerge as a World-Class TowerCo

Zone C – The Insights

transformation objectives
initial actions
initial results / rewards

EMBRACE COTS
OSS: configuration vs. customisation (SP5)
RAN: multi-vendor / cRAN & RRH / virtualised
MBH: multi-party (OLO)
Decommissioning: remove cost & dependencies from monolithic OSS and legacy infrastructure
KPI: increased service levels ⊕ availability ⊖ failure

- commodity components with lower cost base / greater choice
- vendor agnostic = zero lock-in
- virtualise everything everywhere
- increase MTBF on OSS / IT / MBH
- decrease MTTR on tower / antennas

LEVERAGE SOFTWARE DEFINED
Virtualisation: Software Driven Data Centres
Orchestration: End-to-End process management with the inclusion of industry standard APIs (SP7)
Automation: driving scaling of rollouts & enhancements
Multi-tenancy: single instance serving multiple tenants
Utilisation: high asset usage ⊖ CAPEX ⊖ OPEX

- data centre capabilities can now meet / exceed business needs
- human error / response times removed through software automation
- use IT assets to max capacity
- orchestration of multiple "same but different" processes

CONSOLIDATE & OPTIMISE
Estate: combine legacy estates
RAN: fine-tune through drive testing, analytics, crowdsourcing data and trend forecasting
MBH: capacity & latency to be 5G ready (VoLTE & ViLTE)
OPS: business process isolation, zero technical debt
Agility: through outsourced flexibility & scalability (SP6)

- maintain optimal performance - RAN
- "the future is today, addressing technology evolution of tomorrow"
- meet "on-demand" challenges:
  - > spikes
  - > travelling data patterns

RULES OF ENGAGEMENT
UK Regulatory: 1996 / 2003 / 2006 / 2016 / 2017 / 2018
Security: SC/DV paramount, lawful interception, IDPS (SIEM)
Regulatory: Ofcom / European Commission
Data: Quality & Integrity through segregation
Spectrum: Harmonisation

- ever increasing levels of mandated compliance: tiers + wides
- data is the blood of business, quality and quantity is vital

transformation targets to be classified as "World-Class"

WORLD-CLASS

- SD-WAN for MBH
- Backed by World-Class ISV, **Amdocs**, with industry leading OSS and services, conforming to existing and leading industry standards: eTOM, ONAP, LSO

- embrace NFV to gain flexibility on MBH options and deliver to meet demands of shareholders
- foundation must include world class building blocks

CERTAINTY

- Work with **Amdocs** to introduce new global Tower-as-a-Service standards through TMF & MEF for MNOs and vendors to adopt
- Enable new seamless shareholder enablement
- Forecasted capacity and coverage

- enable own and shareholders to reduce costs of integration and technical debt by empowering inclusion and adoption of standards producing thought and market leadership

EXCELLENCE

- pre-emptively find new UK/EU tower estates (i.e. Vodafone rumoured tower sale across the EU)
- Small Cell for 5G (femto, pico, micro, macro)
- Profit-Centre NOT Cost-Centre ⊕ ROI
- Dependable Mean Time To Repair (MTTR)

- technology laggards never innovate
- achievable SLA's
- ability to expand into new territories with confidence

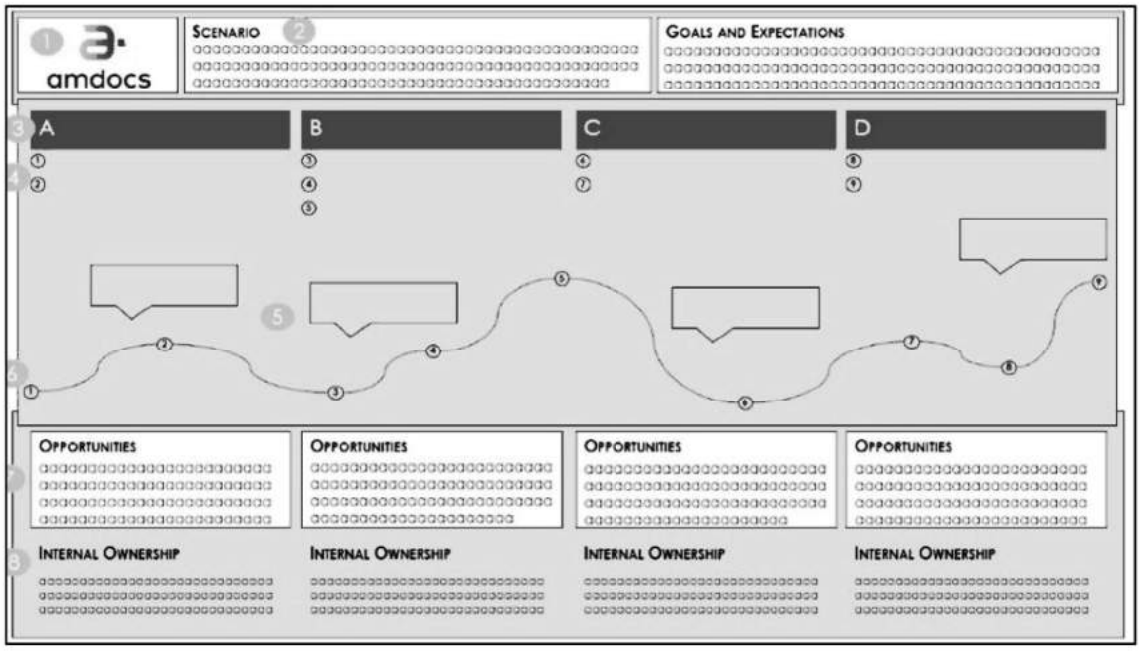
FLEXIBILITY

- On-Demand rollout and RF planning
- Enter new territories: EMEA, APAC, CALA, NAM – post Brexit opportunities
- Offer to global market: Tower-as-a-Service

- spectrum harmonisation will drive equipment and device economies of scale
  > key to shareholders ROI
- market share and position is awarded to innovators who drive early adoption

- ATT/DOX: ECOMP → ONAP
  - → Linux Foundation
  - → 50 largest providers
  - → 60% global subscribers

Journey Mapping Instructions



Summary: Journey maps combine two powerful instruments—storytelling and visualization—in order to help teams understand and address customer needs. While maps take a wide variety of forms depending on context and business goals, certain elements are generally included, and there are underlying guidelines to follow that help them be the most successful.

What Is a Customer Journey Map?

Because this question is such a common one, let's start with the direct answer:

Definition: A customer journey map is a visualization of the process that a person goes through in order to accomplish a goal. It's used for understanding and addressing customer needs and pain points.

In its most basic form, journey mapping starts by compiling a series of user goals and actions into a timeline skeleton. Next, the skeleton is fleshed out with user thoughts and emotions in in order to create a narrative. Finally, that narrative is condensed into a visualization used to communicate insights that will inform design processes.

Journey mapping combines two powerful instruments: storytelling and visualization.

Storytelling and visualization are essential facets of journey mapping because they are effective mechanisms for conveying information in a way that is memorable, concise and that creates a shared vision. Fragmented understanding is chronic in organizations where KPIs are assigned and measured per individual department or group because many organizations do not ever piece together the entire experience from the user's standpoint. This shared vision is a critical aim of journey mapping, because without it, agreement on how to improve customer experience would never take place.

Journey mapping creates a holistic view of customer experience, and it's this process of bringing together and visualizing disparate data points that can engage otherwise disinterested stakeholders from across groups and spur collaborative conversation and change.

While journey maps vary based on the specific context for which they are used, they tend to follow a general model that includes zones for the "lens," the mapped experience, and the insights learned throughout the process. See below for diagram annotations.

Zone A: The lens provides constraints for the map by assigning **(1)** a persona ("who") and **(2)** the scenario to be examined ("what").

Zone B: The heart of the map is the visualized experience, usually aligned across **(3)** chunkable phases of the journey. The **(4)** actions, **(5)** thoughts, and **(6)** emotional experience of the user has throughout the journey can be supplemented with quotes or videos from research.

Zone C: The output should vary based on the business goal the map supports, but it could describe the insights and pain points discovered, and the **(7)** opportunities to focus on going forward, as well as **(8)** internal ownership.

Why Do You Need a Journey Map and When Should You Have One?

Journey maps should always be created to support a known business goal. Maps that do not align to a business goal will not result in applicable insight. The goal could be an external issue, such as learning about a specific persona's purchasing behaviours, or an internal issue, such as addressing lack of ownership over certain parts of the customer

experience. Some potential business goals that journey mapping could be applied toward are listed below.

Shift a company's perspective from inside-out to outside-in. If an organization lets internal processes and systems drive decisions that affect customer experience, a journey map could help turn the culture of that organization by refocusing on the thoughts, actions and emotions of customers. Journey mapping sheds light on real human experiences that often organizations know very little about.

Break down silos to create one shared, organization-wide vision. Because journey maps create a vision of the entire customer journey, they become a tool for creating cross-department conversation and collaboration. Journey mapping could be the first step in building an organization-wide plan of action to invest in customer experience, as it helps answer the question, "Where do we start?" by highlighting areas of friction.

Assign ownership of key touchpoints to internal departments. Often, areas of inconsistencies and glitches in customer journeys exist simply because no internal team has been tasked with ownership of that element. Journey maps can create clarity around alignment of departments or groups with different stages or key touchpoints in the journey that need addressing.

Target specific customers. Journey maps can help teams focus in on specific personas or customers, whether that means understanding differences or similarities across the journeys of multiple personas, prioritizing a high-value persona or exploring ways to target a new type of customer.

Understand quantitative data. If you are aware through analytics or other quantitative data that something specific is happening—maybe online sales are plateauing, or an online tool is being underutilized—journey mapping can help you find out why.

Key Elements of Customer Journey Maps

While journey maps can (and should) take a wide variety of forms, certain elements are generally included:

Point of view. First and foremost, choose the "actor" of the story. Who is this journey map about? For example, a university might choose either students or faculty members, both of which would result in very different

journeys. “Actors” usually aligns with personas, if they exist. As a guideline, when creating a basic journey map, use one point of view per map in order to provide a strong, clear narrative.

Scenario. Next, determine the specific experience to map. This could be an existing journey, where mapping will uncover positive and negative moments within that current experience, or a “to-be” experience, where the mapper is designing a journey for a product or service that doesn’t exist yet. Make sure to clarify the user’s goal during this experience. Journey maps are best for scenarios that describe a sequence of events, such as purchasing behaviour or taking a trip.

Actions, mindsets, and emotions. At the heart of a journey map’s narrative is what the user is doing, thinking, and feeling during the journey. These data points should be based on qualitative research, such as field studies, contextual inquiry, and diary studies. The granularity of representation can vary based on the purpose of the map. Is the purpose to evaluate or design an entire, broad purchasing cycle or a contained system?

Touchpoints and channels. The map should align touchpoints (times when the actor in the map actually interacts with the company) and channels (methods of communication or service delivery, such as the website or physical store) with user goals and actions. These elements deserve a special emphasis because they are often where brand inconsistencies and disconnected experiences are uncovered.

Insights and ownership. The entire point of the journey-mapping process is to uncover gaps in the user experience (which are particularly common in omnichannel journeys), and then take action to optimize the experience. Insights and ownership are critical elements that are often overlooked. Any insights that emerge from journey mapping should be explicitly listed. If politically possible, also assign ownership for different parts of the journey map, so that it’s clear who’s in charge of what aspect of the customer journey. Without ownership, no one has responsibility or empowerment to change anything.

Even with all the above critical elements included, two journey maps could look completely different, yet both be perfectly suitable for the context in which they were designed. Trade-offs in scope, focus, and breadth vs. depth are required when deciding on what elements to

include. To make informed decisions on those trade-offs, consider the following:

What level of detail is needed in order to tell the complete story?

What elements (such as device, channel, encountered content) are also necessary in order to provide the most truthful narrative?

Is the purpose of this journey map to diagnose issues with a current experience or to design a new experience?

What's the balance between external actions (on the customer side) and internal actions (on the organization side)?

Who will be using this journey map?

Rules for Creating Successful Journey Maps

Successful journey maps require more than just the inclusion of the "right" elements. Journey mapping should be a collaborative process informed by well-defined goals and built from research. It requires hard work to keep the process on the right track and to build the buy-in needed to evangelize the insights it provides. Below are some tips for making sure that the process starts and stays in the right direction:

Establish the "why and the "what". First, identify the business goal that the journey map will support. Make sure there are clear answers to these basic key questions before you begin the process:

What business goal does this journey map support?

Who will use it?

Who is it about and what experience does it address?

How will it be shared?

Base it on truth. Journey maps should result in truthful narratives, not fairy tales. Start with gathering any existing research, but additional journey-based research is also needed to fill in the gaps that the existing research won't cover. This is a qualitative-research process. While quantitative data can help support or validate (or aid in convincing stakeholders who may view qualitative data as "fuzzy"), quantitative data alone cannot build a story.

Collaborate with others. The activity of journey mapping (not the output itself) is often the most valuable part of the process, so involve others.

Pull back the curtain and invite stakeholders from various groups to be a part of compiling the data and building the map.

Don't jump to visualization. The temptation to create an aesthetic graphic or jump to design can lead to beautiful yet flawed journey maps. Make sure the synthesis of your data is complete and well-understood before moving to creating the visual.

Engage others with the end product. Don't expect to get "buy-in" and foster interest in your journey map by simply sending a lovely graphic as an email attachment. Make it a living interactive document that people can be a part of. Bring up your story in meetings and conversations to promote a narrative that others believe in and begin to reference. One idea is to create a journey-mapping showroom where anyone not on the direct team can come experience the process and resulting artifacts.