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CHARACTERISTIC TRAITS OF 'DIGITAL TRANSFORMATION' PROJECTS AND ITS REQUISITES

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ABSTRACT

This report as the title suggests, is a brief write up on how a digital transformation project takes place. We start by understanding what ‘digital transformation’ means. We then try to understand some basic concepts (project management, analytics, content management systems, etc.) to apply them to a ‘digital transformation’ project. Every project uses tools. This is where the practical knowledge acquired from the internship at Amplifon is essential. The report dwells extensively on what tools are used in real life to ensure that a ‘digital transformation’ project progresses successfully. Going through this report should give the reader an idea about how to tackle projects of a ‘digital’ nature. This a verified methodology as it is implemented in a massive company such as Amplifon undergoing a largescale ‘digital transformation’.

RIEPILOGO

Come suggerito dal titolo questo è un breve riepilogo su come avviene un progetto di trasformazione digitale in una azienda di medio-grandi dimensioni, come Amplifon. Prima di tutto, iniziamo col definire il concetto di "Digital Transformation" (o trasformazione digitale), per poi definire i concetti di base del cosiddetto project management (project management, analytics, content management systems, etc.) Ogni progetto utilizza strumenti. E' qui che la conoscenza pratica acquisita durante lo stage presso Amplifon risulta fondamentale. Il rapporto descrive in modo dettagliato quali strumenti vengono utilizzati nella vita reale per garantire che un progetto di ‘trasformazione digitale’ progredisca con successo. Leggendo questa relazione l'intenzione è quella di dare al lettore un'idea su come affrontare progetti di natura ‘digitale’. Quanto descritto vuole essere una metodologia applicata concretamente in una società di medio-grandi dimensioni, durante la fase di digital transformation implementata negli anni nelle regions in cui Amplifon è leader di mercato.

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CHAPTER 1 INTRODUCTION

Digital transformation is the continuous process of employing digital technologies, namely mobile, cloud, social business, and big data and analytics (BDA), coupled with organizational, operational, and business model innovation, to create new ways of operating and growing the business.

Why go through such a transformation? In one word, survival. Today's customers are fundamentally different from customers of yester years in that they are harder to acquire, retain, and delight because of the explosion in digital technologies consumers use day to day. These new digital experiences are forcing companies to play catch-up and match the innovative and engaging interactions and products that early adopters are already offering to their customers.

“Present and future shifts and changes can be induced by several causes, often at the same time, on the levels of customer behavior and expectations, new economic realities, ecosystem/industry disruption and (the accelerating adoption and innovation regarding) emerging or existing digital technologies. In practice, end-to-end customer experience optimization, operational flexibility and innovation, are key drivers of digital transformation, along with the development of new revenue sources and ecosystems.

Digital transformation is a journey with multiple connected intermediary goals, in the end striving towards continuous optimization across processes, divisions and the business ecosystem of a hyper-connected age where building the right bridges in function of that journey is key to succeed. Digital transformation aims to create the capabilities of fully leveraging the possibilities and opportunities of new technologies and their impact faster, better and in more innovative way in the future”.¹

This report aims to provide an overview about the requirements of such a ‘Digital Transformation’ process. Starting from what it is all about, the elements necessary for a transformation to occur, real life implementation of the discussed elements and finally some takeaways at the very end. This report will also get you familiar with the frameworks that are necessary to for such a project to be successfully implemented.

The digital transformation of business is a new phenomenon, and no company has yet reached the end state nor definitively defined it. But the contours are becoming clearer, as are the practices that move companies forward. Digital strategies will need to address the increasingly blurred distinction between the online and offline worlds.

¹ Source: <https://www.i-scoop.eu/digital-transformation/>

CHAPTER 2 LITERATURE REVIEW

2.1 Project Management

According to the Project Management Institute (PMI) a project can be defined as a temporary endeavor undertaken to create a unique product, service or result.

A project is temporary in that it has a defined beginning and end in time, and therefore defined scope and resources.

And a project is unique in that it is not a routine operation, but a specific set of operations designed to accomplish a singular goal. So a project team often includes people who don't usually work together – sometimes from different organizations and across multiple geographies.

The development of software for an improved business process, the construction of a building or bridge, the relief effort after a natural disaster, the expansion of sales into a new geographic market — all are projects.

And all must be expertly managed to deliver the on-time, on-budget results, learning and integration that organizations need.

Project management, then, is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.

It has always been practiced informally, but began to emerge as a distinct profession in the mid-20th century. PMI's 'A Guide to the Project Management Body of Knowledge' identifies its recurring elements:

Project management processes fall into five groups:

1. Initiating
2. Planning
3. Executing
4. Monitoring and Controlling
5. Closing

Project management knowledge draws on ten areas:

1. Integration
2. Scope
3. Time
4. Cost
5. Quality
6. Procurement

7. Human resources
8. Communications
9. Risk management
10. Stakeholder management

All management is concerned with these, of course. But project management brings a unique focus shaped by the goals, resources and schedule of each project. The value of that focus is proved by the rapid, worldwide growth of project management:

- as a recognized and strategic organizational competence
- as a subject for training and education
- as a career path

Now that we have a general idea about what project management is all about, let us apply this knowledge and understand what needs to be done when a digital project needs to be managed. Essentially it is project management applied to a digital project. According to Director of Projects Suzy Bates and Project Manager Chris Devidal from Four Kitchens (a popular digital strategy firm), here is the breakdown:

1. Kick it off right

With a sufficiently detailed contract, it should be easy to transition into kicking off the project with your team.

Make sure you equip your team for success with a detailed project plan. It should include:

- a. Breakdown of deliverables.

Include all the steps to get from where you are to a finished project. For example, if you are building a new website for a client, your project plan should not say “Build website.” Break each task down into steps, like “purchase domain”, “create dev environment,” “design homepage,” etc. Each of these steps should have an established process. For example, in the “purchase domain” task: what is the established domain company your business will purchase from? Do you purchase one, three or five-year ownership? Is this purchased by your company or billed separately to the client?

- b. Team roles.

Now that you have broken down the deliverables into smaller tasks, determine who on your team will do what. Include internal QA tasks that precede sending deliverables to the client for approval. Also be sure to include client tasks, such as reviewing and approving initial mock ups.

c. Due Dates.

Your project plan should include deadlines for you and the client, broken down for each deliverable. If you're billing by milestone or in sprints, make sure each deadline is tied to a payment date.

d. Dependencies.

Make sure your team knows what pieces depend on other pieces to be finished before they can be implemented, so all of the different parts can come together smoothly.

It's worth going through the project planning process even if you're a team of one. As your only employee, you need to be an effective manager to get the most out of the hours you will be putting in.

2. Communication

The success of a complex project hinges on everyone communicating with each other throughout the process. "Engage in open, honest, and regular communication," Suzy says. "Talking with the clients every day helps them hear all the bumps in the road. Clients end up feeling like team members rather than clients."

Make a habit of staying in touch with every stakeholder with:

a. Internal Status Meetings.

They don't have to be hour-long gab-fests, but a quick check-in meeting for updates and next steps works wonders to keep a complex project moving.

b. Client Status Meetings.

Brief touch-base meetings with the client can keep them posted on your progress and remind them of upcoming deadlines. Chris says, "We provide the client with a regular report or always-available dashboard which allows them to track the financial progress of the project."

c. Project Management Software.

Services like Asana, Basecamp, and Mavenlink all make it easier to see what's due next and who owns what, as well as serving as a repository for resources and assets.

Suzy also advises you to find new ways to communicate with clients. "A meeting isn't the only way to get information from them," she said. "We use Slack, chat, video calls, email, and even good old fashioned phone calls."

In addition to your regularly-scheduled meetings and check-ins, reach out to the client proactively when:

- a. Something goes wrong.
Chris says, “Don’t sit on bad news. Seriously, tell them early; tell them now. Clients are angrier if they find out they could have known earlier.” Suzy adds, “Making a mistake isn’t a disaster, so don’t treat it that way. Don’t blame. Learn.”
- b. Before you miss a deadline.
“Call out a client when they are being hard to deal with,” Chris says, “as we are all humans and will likely deliver a less awesome solution if we aren’t getting along.”
- c. If you have a major question, such as “Is this an approved resource?” or “Does your company still offer this service we’re building a page for?”
- d. Something is out of scope. Scope creep is the enemy of progress (more on that in part four), so address any changes in scope promptly.

3. Be flexible but realistic

If your contract allows the client to suggest new features, make sure any features you approve are feasible, budgeted for, and added to the timeline. That includes additional processes for your team, such as another round of edits or more testing, as well as additional functionality. Let the client know how a scope change will change the timeline and the budget. “Empower the client to make decisions with the right amount of information,” Suzy recommends. “Give them the information they need so they can know how decisions impact progress and either make adjustments or adjust their expectations.”

As you balance the client relationship with project expectations, scope creep is one of the most common risks that web agencies encounter. Don’t be afraid to assert yourself if the client asks for a major addition that would substantially delay the project. It’s okay to suggest that you deliver the original project first as a phase one, then begin a new phase two project to integrate the feature they suggested. That way you won’t have an ever-lengthening timeline with no deliverable in sight.

4. Standardize on what works well

It may take a few projects to develop a workflow that works well for you and your team. As you learn which project management tools and cadences work best, standardize on them. It's important that you create repeatable processes to reach your agency's maximum efficiency.

"Repeatable processes are more efficient in that the variation from the planned path is much more easily recognizable," Suzy says. "Additionally, the learning curve is smaller if you have done at least some of it before."

Four Kitchens has found that the following tools help their team with project management:

- Harvest for time tracking
- HUBPlanner for people time planning (resource planning)
- JIRA for task definition and tracking
- Google Docs for spreadsheets, documents, sharing of documents.
- Periscope for amalgamation of Harvest, HubPlanner and Budget data in a database.

Once your project is delivered, it's good to take a step back and evaluate how the process went. Take a clear-eyed inventory of what your team did well and what could stand to be improved. Chris says, "We have a culture where blaming is not allowed, so when something happens we try to learn from it rather than point the finger. Retrospectives are a core element of learning how to do better next time. Caring communication about mess-ups always leads to productive outcomes."

The above example can be treated as a short case study. Case studies are important because they help make something being discussed more realistic for both teachers and learners. Case studies help people to see that what they have learned is not purely theoretical but instead can serve to create practical solutions for real life dilemmas.

2.2 Analytics and User Experience

Data analytics allows companies to gather historic, real-time or predictive insights from electronic data that can be internal or external to the organization; it uncovers hidden patterns and correlations that allow companies to make better business decisions. Unless you are determinedly off-grid, you will see data analytics in action every day. Those adverts that appear on every web page you visit? They are the result of data analytics – an algorithm is furiously analyzing your browsing history, selecting and showing you ads for things that it thinks you might like to buy.

Analytics vastly improves many areas of our lives. For example, IBM's Watson initiative – essentially computers that learn from experience – is being used in diagnostic medicine, in some cases to predict infections in premature babies before symptoms even appear. Traffic

flows in major cities are regulated using predictive and time-sensitive information, including weather reports and social media information. And Toyota has just launched a trial service in Japan that uses data analytics to predict the likelihood of serious injury during a car crash, relaying that information to nearby hospitals to use in deciding whether to dispatch ground or air ambulances.

An article authored by Jennifer Cardello (Director of User Research at athenahealth) best summarizes uses for analytics in user experience. Personally, it best reflects on the activities that we carry out at Amplifon and hence would be an insightful take on analytics and user experience.

Analytics has traditionally been used to inform marketing strategy and tactics, but we now see more usability and user-experience professionals relying on this quantitative-data source to aid in research and design.

The biggest issue with analytics is that it can very quickly become a distracting black hole of “interesting” data without any actionable insight.

Probably the worst thing you can do is teach someone how to use an analytics system and hope she will get you some interesting findings. Even a “free” analytics service will cost you a fortune if it redirects resources from more productive uses. Many beginners get stumped over one of three hurdles:

Scope of metrics: So many things that can be measured, but which are meaningful?

Difference between metrics: Which metrics best answer specific questions?

Interface complexity: How do you get the analytics system to tell you what you want to find out?

Because of this last point, many people end up jumping in the deep end and focusing on the tool instead of the work that it is intended to support. With that in mind, we recommend that UX professionals back up a step and think about how analytics data can supplement current methods and processes.

After interviewing a variety of UX teams regarding their use of analytics and other web data, we discovered some interesting high-value UX uses for analytics. We’ll cover 3 in this article:

- Issue indication: Notifying the team of potential problems reaching goals
- Investigation: Identifying potential causes of issues
- Triangulation: Adding data to supplement qualitative research

1. Issue indication

Some UX teams collaborate with optimization specialists while designing the site or launching new features to develop and implement a measurement plan. UX teams receive reports daily or weekly in order to monitor the site’s ability to meet

stated goals. They can use the web metrics to diagnose specific issues or rely on them as clues to guide further investigations.

A measurement plan consists of:

- a. Goals/macro conversions: These are the big-picture actions that users need to complete on the site in order for it to be successful. Examples include the number of purchase completions and the number of lead submissions.
- b. Desirable actions/micro conversions: These are smaller actions that, when combined, support the meeting of the goal—such as progressing along a lead-generation funnel. Examples include visiting a specific page, clicking a particular link, or entering data in a form.
- c. Web metrics: These are web-analytics data that indicate whether these desirable actions occur; they help UX teams identify potential issues.

2. Investigation

a. Traffic Issues

Example investigation: Determine if there is one traffic source (Google, Bing, Yahoo, direct, email campaigns, etc.) that is responsible for a decrease in page visitors.

Useful analytics report: Pages (filtered by the page URI and using Source as the secondary dimension)

In Google Analytics, you can generate page-specific reports that display where the traffic to the page originated (search, email, direct, etc.).

b. Technical Issues

Example investigation: Determine if a page element is not loading properly.

Useful analytics report: Event Pages

The Event Pages report lists all the pages where events are tracked. You can select the specific page being investigated to get metrics on that specific-page's events.

c. Content and Visual-Design Issues

Example investigations:

Determine if new wording may not effectively communicate the benefits of or the process for taking a specific action.

Determine if imagery, typography, colors, and/or layout are distracting from calls to action (CTAs).

Useful analytics report: In-page Analytics

In-Page Analytics indicates what links users select.

d. Navigation Issues

Example investigation: Determine if specific links/buttons are not being clicked.

Useful Analytics Report: Pages (filtered by the page URI and selecting the Navigation Summary tab)

Navigation Summary is a tab you can select from any Pages report (illustrated below). It details from which website pages people came

before visiting the page of interest and where they went after visiting that page.

3. Triangulation

In this mode, the UX team uses analytics to verify findings derived from qualitative research (e.g., usability testing) and gather additional clues to help in defining a solution. If the original usability test was run with about 5 users — as we often recommend — then there is always the risk that estimates like success rates will be wrong. But such a quick test has the advantage of rapidly pinpointing a potential trouble spot, which can then be instrumented for targeted collection of a few thousand analytics data points that support much more accurate estimates.

Examples of usability-test findings to verify with analytics data:

Finding: Study participants don't know where to find information about a topic because the word used on the site is different than what they use.

Additional questions to answer: Are people searching for those terms that participants mentioned in the study?

Useful analytics report: Search Terms

The Search Terms report lists the terms users enter into the website's own search box (not web-wide search). You can download the search-terms lists corresponding to any time period and conduct more extensive analysis. Terminology that users typed into your own search box is a prime candidate for use to turn your content into user-centered language.

Finding: A feature is not used or a page is not accessed because study participants didn't notice the link.

Additional question to answer: Where are users going instead?

Useful analytics reports: Pages (filtered by the page URI and selecting the Navigation Summary tab) and In-Page Analytics (see examples above in the Investigations section)

Finding: A form is not being completed because people don't feel comfortable providing required information.

Additional question to answer: On which fields are people abandoning the form?

Useful analytics report: Event Pages

2.3 Website Development and Content Management System (CMS)

Carrying out literate review on web development can be a very arduous task. It is a vast subject, comprising of many different topics (most of which are related to technologies and programming languages). It can take a very 'technical' turn which is not the intended aim of this report.

For the sake of the report, let us examine the definitions of web development and content management systems.

According to technopedia, web development “broadly refers to the tasks associated with developing websites for hosting via intranet or Internet. The Web development process includes Web design, Web content development, client-side/server-side scripting and

network security configuration, among other tasks. Web development is also known as website development.”

BusinessDictionary defines content management as “a software application used to upload, edit, and manage content displayed on a website. A content management system can perform a variety of different tasks for a website including regulating when content is displayed, how many times the content is shown to a specific user, and managing how the content connects or interacts with other elements of the website. This software also enables less technical individuals to manage content on a website easily without having an extensive coding background.”

After having defined both the terminologies, one can infer that a CMS is in fact a subset of web development. It is diluted enough to ensure that a person without extensive technical prerequisites can handle a website. This seems to be the route most large companies seem to take nowadays. Each region has a different requirement when it comes to the website and the contents they need to display. This is the biggest concern that a CMS addresses.

Although features can vary amongst the various CMS offerings, some of the core functions are often considered to be indexing, search and retrieval, format management, revision control and publishing.

- Intuitive indexing, search and retrieval features index all data for easy access through search functions and allow users to search by attributes such as publication dates, keywords or author.
- Format management facilitates turn scanned paper documents and legacy electronic documents into HTML or PDF documents.
- Revision features allow content to be updated and edited after initial publication. Revision control also tracks any changes made to files by individuals.
- Publishing functionality allows individuals to use a template or a set of templates approved by the organization, as well as wizards and other tools to create or modify content.

Other features include:

- SEO-friendly URLs
- Integrated and online help, including discussion boards
- Group-based permission systems
- Full template support and customizable templates
- Easy wizard-based install and versioning procedures
- Admin panel with multiple language support
- Content hierarchy with unlimited depth and size

- Minimal server requirements
- Integrated file managers
- Integrated audit logs

Some of the advantages of using a CMS are:

- Reduced need to code from scratch.
- The ability to create a website quickly.
- The ability to create a unified look and feel.
- Version control.
- Edit permission management.

Some of the disadvantages are:

- Limited or no ability to create functionality not envisioned in the CMS (e.g., layouts, web apps, etc.).
- Increased need for special expertise and training for content authors.
- Limited to preset conditions, for example the layout of a page. In order to make changes to the preset conditions, the user needs to have higher technical skills.

Examples of CMS:

- WordPress.
- Drupal.
- Joomla!
- ExpressionEngine.
- TextPattern.
- Radiant CMS.
- Liferay etc.

2.4 User Acceptance Testing (UAT)

UAT stands for User Acceptance Testing. We know what testing is, acceptance means approval or agreement. User in the context of a software product (here: website) is either the consumer of the software or the person who requested it to be built for him/her (client).

This is typically the last step before the product goes live or before the delivery of the product is accepted. UAT is after the product itself is thoroughly tested (i.e. after system testing).

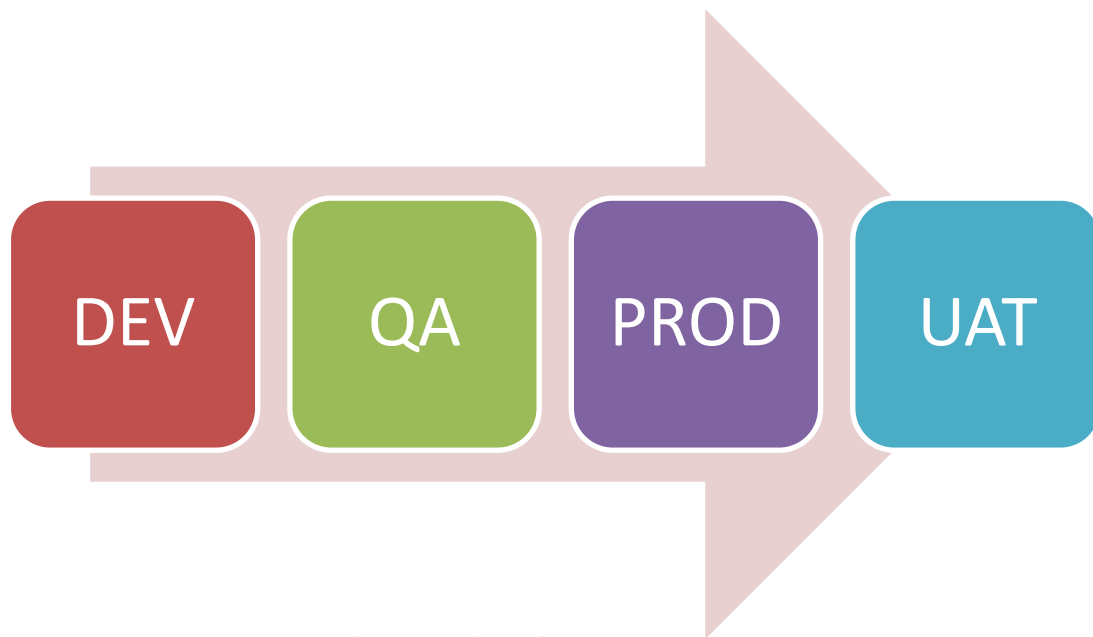


Figure 1: Flow of processes

UAT is performed by either someone who is buying a product (in the case of commercial software) or someone who has had a software custom built through a software service provider or the end user if the software is made available to them ahead of time and when their feedback is sought.

The easiest way to understand this process is to think of UAT as an autonomous testing project – which means, it will have planning, designing and the execution phases.

The following are the pre-requisites before the plan phase begins:

1. Gather the key acceptance criteria

Acceptance criteria- to simply put, this is a list of things that are going to get evaluated before accepting the product. These could be of 2 types:

- a. Application functionality or business related
Ideally all key business functionality should get validated but due to various reasons, including time, it is not practical to do it all. Therefore, a meeting or two with the client or the users who are going to be involved in UAT can give us an idea on how much testing is going to be involved and what aspects are going to be tested.
- b. Contractual – we are not going to go into this and the involvement of the QA team in all this is almost nothing. The initial contract that gets drawn up even before the SDLC (systems development life cycle) begins is reviewed and an agreement is reached upon whether all the aspects of the contract have been delivered or not.

We are going to focus only on application functionality.

2. Define the scope of QA involvement. QA team's role is one of the following:

- a. No involvement – This is very rare.
- b. Assist in UAT – most common. In this case, their involvement could be training the UAT users in how to use the application and be on standby during the UAT to make sure they can help the users in case of any difficulty. Or in some cases, in addition to being on standby and assisting, they might share their responsibility and record the results or log bugs etc. while the users perform the actual testing.
- c. Perform UAT and present results – If this is the case, the users will point the areas of the AUT (application under testing) that they want to evaluate and the evaluation itself is performed by the QA team. Once done, the results are presented to the clients/users and they will make a decision on whether the results that they have in hand are sufficient and in accordance with their expectations in order to accept the AUT. The decision is never that of the QA team.

Depending on the case on hand, they decide which approach is best.

➤ UAT Test planning

The process is almost the same as with the regular test plan for the system phase. The most common approach followed in most of the projects is to plan for both system and UAT testing phases together.

➤ UAT design

The gathered acceptance criteria from the users are used in this step. Samples could look like the following:

(These are excerpts from CSTE CBOK. This is the one of the best of the few references available about UAT.)

➤ User Acceptance Testing Templates

Number	Acceptance Requirement	Critical		Test Result		Comments
		Yes	No	Accept	Reject	
1	The system must execute to end of job.	√				Payroll will not run in a production status until this requirement has been met.
2	The results of payroll must be correct.	√				Payroll will not run in a production status until this requirement has been met.

Figure 2: Example of a UAT template

Based on the criteria, the QA team gives the users a list of UAT test cases. UAT test cases are not different from our regular system test cases. They are just a sub set since they test all of the application as opposed to just the key functional areas.

In addition to these, the data, templates to record test results, administrative procedures, defect logging mechanism has to be in place before they move to the next phase.

➤ UAT Test execution

Usually, when possible, UAT happens in a conference or war room sort of a set up where the users, PM, QA team representatives all sit together for a day or two and work our work through all the acceptance test cases.

Or in case of QA team performing the tests, they run the test cases on the AUT.

Once all the tests are run and the results are in hand, the **Acceptance Decision** is made. This is also called the **Go/No-Go decision** more colloquially. If the users are satisfied it's a Go, or it's a No-go.

The reaching of the acceptance decision is typically the end of UAT phase.

Important UAT points:

- UAT is not about the pages, fields or buttons. The underlying **assumption** before even the UAT begins is that, all that basic requirements is tested and is working fine.
- UAT is about the entity that is the primary element in the business.
- For example: If the AUT is a ticketing system, the UAT is not going to be about searching, the menu that opens a page etc. It is about the tickets and their reservation, the states that it can take, its journey through the system. Another example, if the site is a car dealership site, the focus is about the “car and its sales” not the site really. So the core business is what is verified and validated and who better to do it than the business owners. That's why UAT makes the most sense when the customer is involved to a major extent.
- UAT is also a form of testing at its core which means **there is a good chance of identifying some bugs at this phase too**. It sometimes happens. Aside from the fact that it is a major escalation on the QA team, the UAT bugs usually means a meeting to sit and discuss how to handle them because following UAT there is usually no time to fix and retest.

The decision would be either to:

- ✓ Push the go-live date, fix the issue first and then move on.
- ✓ Leave the bug as is.

- ✓ Consider it as a part of change request for future releases.
- UAT is classified as Alpha and Beta testing, but that classification is not so important in the context of typical software development projects in a service based industry.
- **Alpha testing** is when UAT is carried out in the software builder's environment and is more significant in the context of commercial off the shelf software.
- **Beta testing** is when the UAT is carried out in the production environment or the client's environment. This is more common for customer facing applications. The users here are the actual customers like you and I in this context.
- Most of the times in a regular software development project, UAT is carried out in the QA environment if there is no staging or UAT environment.

2.5 Trouble Ticket Management

A trouble ticket can be defined as “the result of an end user submitting a help request via an issue tracking system, and it typically contains elements detailing the exact nature of the problem the end user is having with a specific network component. The trouble ticket is then forwarded to the appropriate IT technician, who is responsible for addressing the issues within the trouble ticket based on the ticket's severity, impact to the organization, time received, etc.”²

Issue trackers, bug trackers, modification request control systems—regardless of what specific terminology is used—all roughly refer to the same class of software systems. In the most general of terms, these systems are designed to manage electronic artefacts that: (a) move from a starting state to an end state (and possibly visit several in-between states along the way), and (b) accumulate information during their transitions between these states. More specifically, issue tracking systems are databases that keep track of bodies of information—outstanding issues—such as software defects or “bugs,” feature requests, customer inquiries, etc. The variety in the types of information stored in issue tracking systems has been acknowledged since their earliest incarnations.

All this information represents tasks that move from an opening state to a closed state over time. Along the way, these information artefacts often accumulate additional information as various people within the software team work on them. For example, a bug might gain instructions on how to reproduce the problem, or a feature request might be refined with additional specifications or sketches. Each of these items (or “modification requests” or “issues”) can also have certain attributes associated with them. A bug, for example, might include things like the time the issue was filed, who filed it, what version of the software the bug applied to, and the severity of the bug (e.g., a critical bug that causes loss of data versus a minor one such as an aesthetic imperfection).

² Source: technopedia.com

Within an issue tracking system, each item (or issue or case) generally follows one of a few predefined paths from when it is first opened until it is eventually closed. Depending on the type of issue, there may be various intermediate states as well as cycles within its path. This set of paths is often referred to as the “workflow” supported by an issue tracking system [Bugzilla 2009, Atlassian 2009]. Workflows can vary from very simple and open ended to very detailed and complex. The state diagram in Figure 2.1 illustrates a minimal set of states required for an issue tracking system’s workflow, namely, the “open” and “closed” states and the transitions between them. When a new bug or feature request is created it starts in the “open” state. After work has been completed on this item it follows the “resolve” transition to end up in the “closed” state. If the issue is later found to be incomplete (e.g., a bug reappears or a feature is not fully implemented) it can follow the “reopen” transition back to the “open” state.

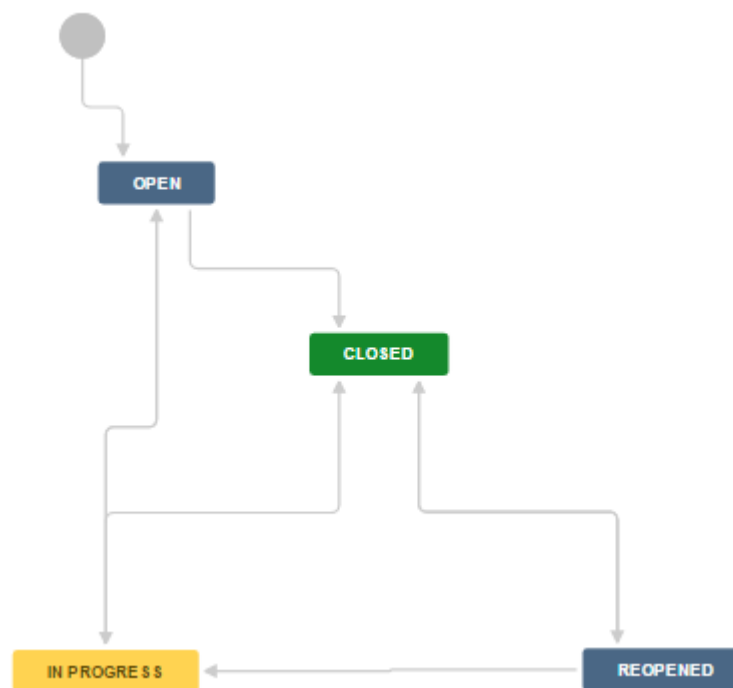


Figure 3 – Simplified issue lifecycle

As eloquent and simple as this set of states is, there are a number of situations in which such a simplified view of issue tracking falls apart. For example, many software development teams require issues to be verified before officially being marked as closed:

When a bug is resolved, it gets assigned back to the person who opened it. This is a crucial point. It does not go away just because a programmer thinks it should. The golden rule is that only the person who opened the bug can close the bug. The programmer can resolve the bug, meaning, “hey, I think this is done,” but to actually close the bug and get it off the books, the original person who opened it needs to confirm that it was actually fixed or agree that it shouldn't be fixed for some reason. —FogBugz Documentation [Fog Creek Software 2009b]

The state diagram illustrated in Figure 4 was reproduced from Bugzilla [Bugzilla 2009]—an open-source issue tracking system—and shows a more complicated, albeit more realistic, set of potential paths an issue may traverse on its journey toward being closed.

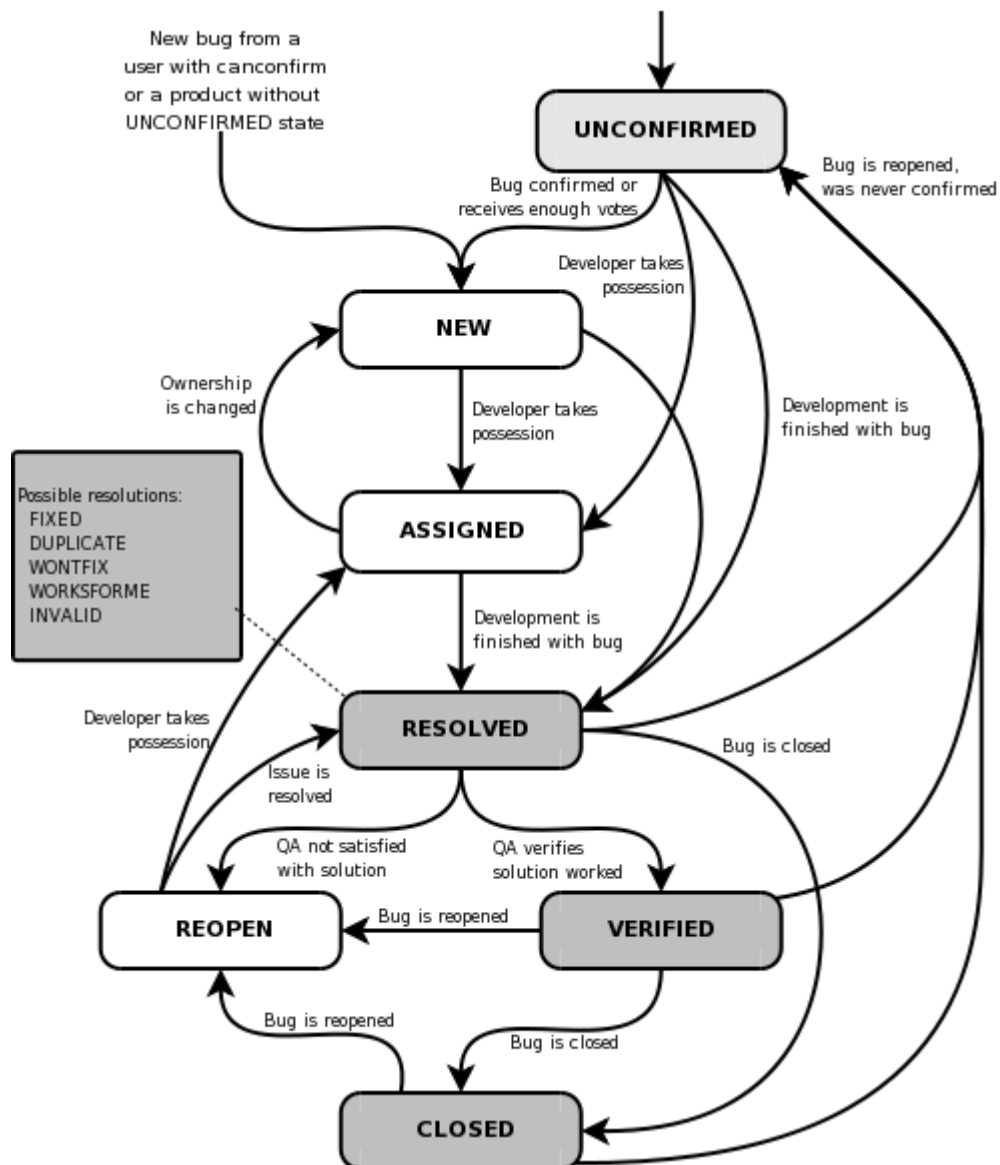


Figure 4 – Issue lifecycle supported by Bugzilla [Bugzilla 2009]

As we can see, the workflow supported by an issue tracking system can quickly escalate to something much more complicated than the rudimentary workflow illustrated earlier in Figure 2.1. In addition to supporting a larger number of states and transition options, the Bugzilla workflow shown in Figure 2.2 also reveals that some states may comprise of multiple sub-states or “statures.” The most common state to exhibit this is the “resolved” state. This is because an issue can make the transition into the resolved state for a variety of reasons—most of which are useful to record for future reference. For example, 12 an issue can be resolved as “duplicate” if another issue exists representing the same problem or feature request. Usually in such an instance the unique identification number of the

duplicate case would be stored along with the resolved issue. Alternatively, a bug could be resolved as “worksforme” (i.e., works for me) to indicate that the person resolving it could not reproduce the problem: he or she either needs more information detailing how to reproduce it or perhaps the bug has already been fixed. The key purpose of issue tracking software, therefore, is to support these detailed workflows and catalogue information as it is appended to each issue during its traversal of these paths. In addition to tracking a specific state of an issue within the workflow, other relevant attributes are also recorded. For example, each issue is “owned” or “assigned” to a specific person within the software team. Tracking such ownership of who is working on what helps provide accountability for ensuring each issue in the system has someone looking after it (this is discussed further in Section 5.5). The underlying database structure of the issue tracker keeps track of all of these various attributes in such a way as to also allow those who use the issue tracking system to search for issues and group them according to various criteria (e.g., by priority, by who initially created the case, by current owner, by date created, etc.).

Issue trackers have come a long way from this initial physical form, but at their core, they still remain primarily focused on simply tracking and archiving issues. What has changed over time, however—in addition to the transition from physical to digital media—is the increasing use of issue tracking systems as an essential form of communication within the development team. Issues still frequently come in from outside customers, but instead of taking the form of a phone call that is transcribed onto a physical card, new issues may now be automatic crash reports submitted by the customer’s software, online entry forms completed by customers, or generated from incoming email. Instead of assigning bugs to 98 one another and indicating their status by placing them into physical boxes, these operations are now done electronically. As issue trackers have evolved to become more central to the software development process, they have also begun to service many of the conversational, archival, and organizational needs of that process. A tool traditionally viewed as a relatively straightforward engineering tool has revealed itself to be a complex facilitator of communication and coordination within what is a fundamentally social process: developing software. Even within small teams that enjoy the benefit of frequent, readily available face-to-face communication, still the issue tracker remains a core component in the successful cooperation of the team’s members.

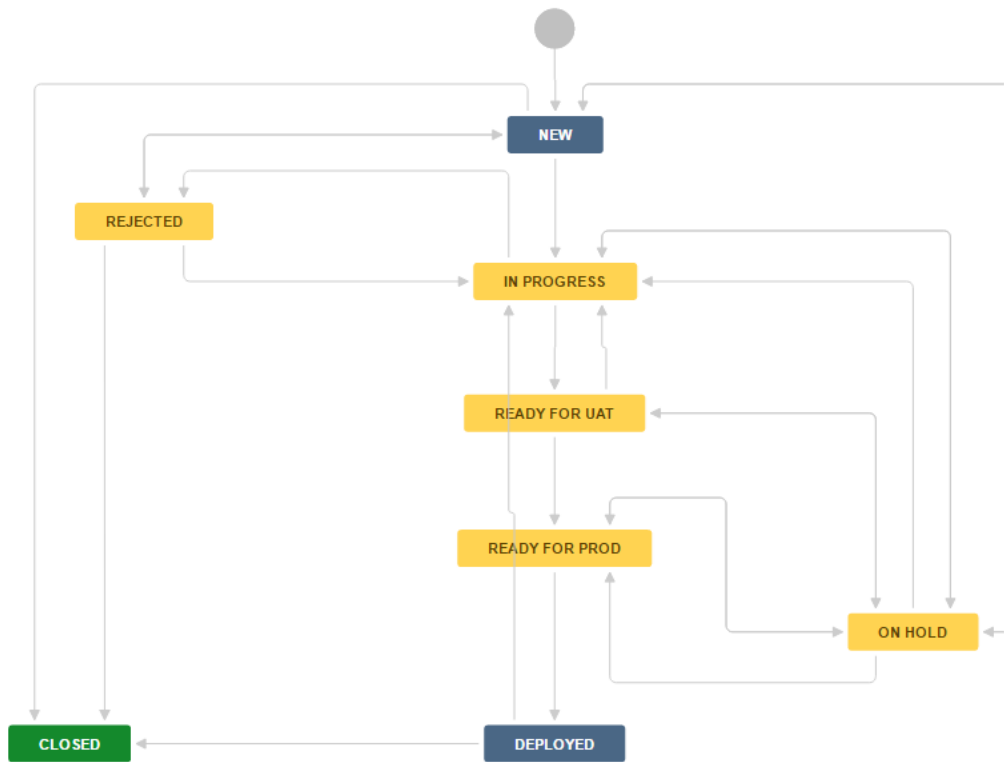


Figure 5 – Workflow for an issue developed at Amplifon

CHAPTER 3 Supportive Frameworks

3.1 The Nine Elements of Digital Transformation

- **Transforming Customer Experience**

The three major building blocks with which companies are digitally transforming customer experience are customer understanding, top-line growth and customer touch points.

- i. **Customer Understanding**

Companies are starting to take advantage of previous investments in systems to gain an in-depth understanding of specific geographies and market segments. Some are exploring social media to understand what makes customers happy — and what leads to customer dissatisfaction.

In addition, companies are learning to promote their brands more effectively through digital media. Companies are also building new online communities to advise and build loyalty with clients in medical, real estate or financial services products. Others are building products that improve branding in lifestyle communities.

Many organizations are building analytics capability to understand customers in more detail. Some insurance companies, for example, are improving their portfolios and cost structures through analytics-based underwriting and pricing. Other companies are conducting analytics-based experiments to drive customer behavior. In one case, a restaurant company is actively conducting experiments in pricing and promotion across a set of franchised stores. The experiment dynamically adjusts product prices in response to demand, weather, inventory levels and proximity to closing time.

- ii. **Top-Line Growth**

Companies are using technology to enhance in-person sales conversations. For example, financial services companies are using tablet-based presentations instead of paper-based slide decks to make sales pitches. Insurance firms are introducing mobile tools to help sales people and customers engage in analytics-based planning. A medical device sales force is replacing in-person interactions with digital interactions. When visiting a doctor's office, a salesperson leaves an iPad with video and other information on new products. The aim is to get the doctor's attention — without inconveniencing the physician or impacting busy office schedules — in order to obtain a 10-minute conversation when the salesperson returns to retrieve the iPad. Better understanding helps businesses to transform the sales experience. Companies are integrating customer purchasing data to provide more personalized sales and customer service or even to offer customized product packages. A hospitality company engaged in location-based marketing uses analytics to send personalized mobile coupons to customers as they near a facility; the company can then track uptake in real time. A mortgage company is setting up a CRM strategy to link customers to local real estate references. This system proposes new offers in real time via the Internet.

Other businesses are using concept stores as flagships for their digital selling innovations. For instance, a mortgage company offers investors an integrated process combining real estate and bank services with external services — and showcases the overall process in a concept megastore.

Some companies try to make life easier for the customer, simplifying their processes through a digital plug-in. One retailer automatically loads a customer's last online shopping list into its e-commerce site. This streamlines the shopping process, allowing customers extra time to look at other products. Customers can then decide whether to use home delivery or a drive-through service with a specific pick-up time.

iii. Customer Touch Points

Customer service can be enhanced significantly by digital initiatives. For example, a bank established a Twitter account to answer client complaints quickly, helping customers avoid going physically to a branch. This digital initiative also leveraged an expert community, allowing crowdsourcing with several employees and other customers.

Companies with multiple channels to the customer are experiencing pressure to provide an integrated experience. Multichannel services require envisioning and implementing change across customer experience and internal operational processes. Many retailers now offer home shopping with the option to receive products by mail or in a store. However, one retail executive described customers being angry that customer service representatives in a store could not access online order history.

Several companies in our study are offering self-service via digital tools. These tools allow the customer to save time, while saving the company money. Many companies are now offering customer apps to enhance customer touch points. In one hospitality company, smartphone apps are linked to the customer's profile, enabling integration across SMS, apps and social media efforts. A media company offers apps with geo-localization and augmented reality to help customers find interesting places to visit and provide special offers via vouchers and e-coupons.

- **Transforming Operational Processes**

Although transformed customer experiences are the most visible — and arguably the most exciting — aspects of transformation, companies are also realizing very strong benefits from transforming internal processes through process digitization, worker enablement and performance management.

iv. Process Digitization

Automation can enable companies to refocus their people on more strategic tasks. A manufacturer has begun to centralize the HR function, allowing economies of scale through self-service while freeing HR people to “focus on enlarging manager skills, rather than counting days off.” A specialty materials company has automated many R&D processes.

Automation allows researchers to focus on innovation and creativity rather than repetitive efforts. It also creates streams of data that can be useful in later data mining efforts.

One paint manufacturer has created fully automated plants that significantly reduce labor requirements, improve product quality and enhance environmental, health and safety performance. An apparel company has moved to digital design processes when collaborating with manufacturing partners. Going digital eliminates most need to ship physical prototypes back and forth, reducing the product development lifecycle by 30%.

v. Worker Enablement

Individual-level work has, in essence, been virtualized — separating the work process from the location of the work. A financial services business rearranged its headquarters so that nobody had an assigned desk, even the CEO. Employees now work from home one or two days per week and, when they are in the office, sit near people with whom they are temporarily collaborating. Meanwhile, the company's collaboration and networking tools allow employees to talk with anyone in the organization from wherever they are sitting. This is setting the stage for further changes related to globalization.

The tools that virtualize individual work, while implemented for cost reasons, have become powerful enablers for knowledge sharing. Salespeople and frontline employees, for example, are beginning to benefit from collaborative tools in which they can identify experts and get questions answered in real time. They are also increasingly gaining access to a single, global view of the company's interactions with a customer.

vi. Performance Management

Transactional systems give executives deeper insights into products, regions and customers, allowing decisions to be made on real data and not on assumptions. This is happening in both internal processes and customer-facing processes. The level of detail is also increasing, allowing managers to compare status across sites or reallocate product manufacturing capacity in ways they could not do before.

Beyond being better informed, digital transformation is actually changing the process of strategic decision-making. Top executives in a medical device manufacturer used the company's existing collaboration tools to extend strategic planning sessions from 12 people to more than 300 of the business's top managers. This enabled better input into the process and better uptake of the vision after decisions were made.

- **Transforming Business Models**

Companies are not only changing how their functions work, but also redefining how functions interact and even evolving the boundaries and activities of the firm.

The three building blocks of this transformation are digital modifications to the business, the creation of new digital businesses, and digital globalization.

vii. Digitally Modified Businesses

One media executive said: “We’ve realized that if we don’t transform the way we do business, we’re going to die. It’s not about changing the way we do technology but changing the way we do business.” The company is finding ways to augment physical with digital offerings and to use digital to share content across organizational silos.

A grocery company is staying true to its traditional business but using digital to transform a new growth business. As one executive reported, “After two years, our e-commerce platform is bringing us 20% of our new clients and our traditional clients are consuming 13% more on average.”

Other businesses are building digital or service wrappers around traditional products. A national post office is creating a free digital mailbox attached to each physical mail address that companies can use as a substitute for a person’s physical mailbox. A business credit company is developing a digital business for some credit products that requires less involvement than their traditional high-touch offerings.

viii. New Digital Businesses

Companies are also introducing digital products that complement traditional products. For example, a sports apparel manufacturer started selling GPS and other digital devices that can track and report on a customer’s workout. Other companies are changing business models by reshaping their boundaries through digital. A mortgage company is moving from being a link in the value chain to being a global assembler of investment products. An airport authority is aiming to become the owner of a traveler’s end-to-end process by providing an integrated multichannel experience, including information on airplane traffic and reservations, duty-free shopping promotions and other benefits.

ix. Digital Globalization

Companies are increasingly transforming from multinational to truly global operations. Digital technology coupled with integrated information is allowing businesses to gain global synergies while remaining locally responsive. These companies benefit from global shared services for finance, HR and even core capabilities like manufacturing and design. Global shared services promote efficiency and reduce risk. They even promote global flexibility. One manufacturer can shift production around the globe with only a few days’ notice in response to interruptions or excess demand.³

³ Source: MIT Sloan Management Review

3.2 Agile Development

Agile is one of the big buzzwords of the IT development industry. But exactly what *is* agile development?

Put simply, agile development is a different way of managing IT development teams and projects.

The use of the word agile in this context derives from the agile manifesto. A small group of people got together in 2001 to discuss their feelings that the traditional approach to managing software development projects was failing far too often, and there had to be a better way. They came up with the agile manifesto, which describes 4 important values that are as relevant today as they were then. It says, “we value:

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.”

Ever since then, the use of methods that support these values has become increasingly popular.

From my use of various agile methods, I have written about 10 key principles of agile. These are characteristics that are common to all agile methods, and the things that I think make agile fundamentally different to a more traditional waterfall approach to software development. They are:

1. Active user involvement is imperative
2. The team must be empowered to make decisions
3. Requirements evolve but the timescale is *fixed*
4. Capture requirements at a high level; lightweight & visual
5. Develop small, incremental releases and iterate
6. Focus on frequent delivery of products
7. *Complete* each feature before moving on to the next
8. Apply the 80/20 rule
9. Testing is integrated throughout the project lifecycle – test early and often
10. A collaborative & cooperative approach between all stakeholders is essential

There are various methodologies that are collectively known as agile, as they promote the values of the agile manifesto and they are consistent with the above principles. The most popular ones are:

DSDM is probably the original agile development method. DSDM was around before the term ‘agile’ was even invented, but is absolutely based on all the principles we’ve come to know as agile. DSDM seems to be much less well-known outside of the UK.

Scrum is also an agile development method, which concentrates particularly on how to manage tasks within a team-based development environment. Scrum is the most popular and widely adopted agile method – I think because it is relatively simple to implement and addresses many of the management issues that have plagued IT development teams for decades.

XP (Extreme Programming) is a more radical agile methodology, focusing more on the software engineering process and addressing the analysis, development and test phases with novel approaches that make a substantial difference to the quality of the end product.

DSDM is probably the most complete agile methodology, whereas Scrum and XP are easier to implement and complementary because they tackle different aspects of software development projects and are both founded on very similar concepts.

Over the last 10 years, there is an ever-increasing volume of success stories, where companies have dramatically improved the success and performance of their IT development teams and projects. This has caused agile to be widely adopted across a variety of industries, including media and technology, large corporates, and even government.

In reality, though, agile is not a magic bullet for all software development issues. The real trick is to know lots of techniques from various waterfall and agile development methods, and to select a mixture of the best approaches that are most appropriate for any given situation. To do this reliably with any degree of success really requires a lot of experience and skill.

In agile software projects, project management takes a slightly different form, relying far more on the project manager's skills in communication, facilitation, coordination, and emphasizing far less on planning and control.

Agile development can be a very exciting and invigorating approach, although some projects suit agile more than others. The collaboration and visibility can provide a much richer and more rewarding experience for teams to develop great software products. Agile development can be a lot more enjoyable than the waterfall approach, which requires lots more documentation and is less flexible by its nature. And when people enjoy their work, it's amazing what they can achieve!⁴

⁴ allaboutagile.com

3.3 Kanban

Kanban is a popular framework used by software teams practicing agile software development. It is enormously prominent among today's agile software teams, but the kanban methodology of work dates back more than 50 years.

In the late 1940s Toyota began optimizing its engineering processes based on the same model that supermarkets were using to stock their shelves. Supermarkets stock just enough product to meet consumer demand, a practice that optimizes the flow between the supermarket and the consumer. Because inventory levels match consumption patterns, the supermarket gains significant efficiency in inventory management by decreasing the amount of excess stock it must hold at any given time. Meanwhile, the supermarket can still ensure that the given product a consumer needs is always in stock.

When Toyota applied this same system to its factory floors, the goal was to better align their massive inventory levels with the actual consumption of materials. To communicate capacity levels in real-time on the factory floor (and to suppliers), workers would pass a card, or "kanban", between teams. When a bin of materials being used on the production line was emptied, a kanban was passed to the warehouse describing what material was needed, the exact amount of this material, and so on. The warehouse would have a new bin of this material waiting, which they would then send to the factory floor, and in turn send their own kanban to the supplier. The supplier would also have a bin of this particular material waiting, which it would ship to the warehouse. While the signaling technology of this process has evolved since the 1940s, this same "just in time" (or JIT) manufacturing process is still at the heart of it.

➤ **Kanban boards**

The work of all kanban teams revolves around a kanban board, a tool used to visualize work and optimize the flow of the work among the team. While physical boards are popular among some teams, virtual boards are a crucial feature in any agile software development tool for their traceability, easier collaboration, and accessibility from multiple locations.

Regardless of whether a team's board is physical or digital, their function is to ensure the team's work is visualized, their workflow is standardized, and all blockers and dependencies are immediately identified and resolved. A basic kanban board has a three-step workflow: To Do, In Progress, and Done. However, depending on a team's size, structure, and objectives, the workflow can be mapped to meet the unique process of any particular team.

The kanban methodology relies upon full transparency of work and real-time communication of capacity, therefore the kanban board should be seen as the single source of truth for the team's work.

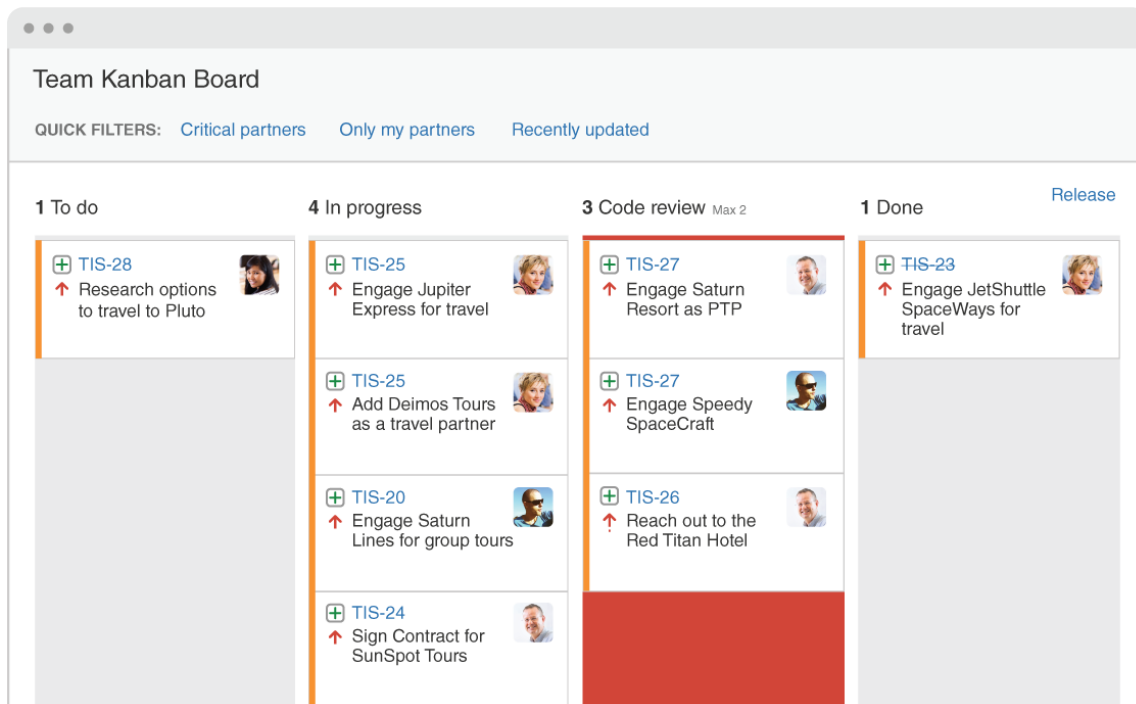


Figure 6 – Example of a Kanban board

➤ Kanban cards

In Japanese, kanban literally translates to "visual signal." For kanban teams, every work item is represented as a separate card on the board.

The main purpose of representing work as a card on the kanban board is to allow team members to track the progress of work through its workflow in a highly visual manner. Kanban cards feature critical information about that particular work item, giving the entire team full visibility into who is responsible for that item of work, a brief description of the job being done, how long that piece of work is estimated to take, and so on. Cards on virtual kanban boards will often also feature screenshots and other technical details that is valuable to the assignee. Allowing team members to see the state of every work item at any given point in time, as well as all of the associated details, ensures increased focus, full traceability, and fast identification of blockers and dependencies.

➤ The benefits of kanban

Kanban is one of the most popular software development methodologies adopted by agile teams today. Kanban offers several additional advantages to task planning and throughput for teams of all sizes.⁵

⁵ Source: Atlassian

CHAPTER 4 Empirical Analysis

In this chapter, the concepts reviewed in the previous section of literature review will be addressed by drawing parallels from the internship in order to provide an empirical analysis in the specific industry. The healthcare industry is ever growing and changing fast.

“The global hearing aids market was valued at USD 4.5 billion in 2015 and is projected to grow with a CAGR of 4.3% over the forecast period. The high growth is expected on account of increasing deafness resulting from increased noise pollution levels, genetic factors, ear infections, birth complications and other factors. The aging population is at a high risk of suffering from hearing loss. In addition, the rise in demand for technologically advanced and aesthetically appealing miniature devices propels the market growth.

The WHO estimates suggests that over 5% of the global population, suffers from disabling hearing impairment. Moreover, nearly 15% of the global adult population is affected by some degree of hearing loss. Majority of which is found in the less developed nations. Additionally, the estimates also suggest that approximately one-third of the population over 65 years of age suffers from disabling hearing loss. The inability to communicate leads to feeling of social exclusion, loneliness, and frustration, especially amongst the aged people. Moreover, the prevailing high unmet need of these instruments globally is anticipated to lead the market growth.

‘Europe is the largest regional market with a share of 38.3% in 2015’

In 2015, Europe accounted for the maximum revenue share of 38.3% followed by North America. The large share of Europe can be attributed to factors such as growing geriatric population base, increasing prevalence of hearing loss in the region, and high purchasing power of the patients. Also, the growing awareness about these healthcare devices contributes to the large share of the region.

Asia Pacific is expected to emerge as the fastest growing region with a CAGR of 5.4% over the forecast period. The developing countries in Asia-Pacific region, such as India and China, exhibit potential market expansion opportunities due to various contributing factors, such as the large patient pool and surge in the aging population, upsurge in hearing-related problems, increasing awareness amongst the patients, and developing healthcare infrastructure & services due to the growing government funding”.⁶

⁶ Report: Hearing Aids Market Analysis By Product Type (In-The Ear, Receiver-In-The-Ear, Behind-The-Ear, Canal Hearing Aids ITC, CIC, IIC), By Technology Type (Digital And Analog Hearing Aid), And Segment Forecasts To 2024

4.1 About Amplifon

“In the 1940s the development of the transistor revolutionized electronics, bringing us the transistor radio and the first electronic hearing aids.

Among the pioneers in this new development was Englishman Algernon Charles Holland, who founded Amplifon in Milan, Italy in 1950 to distribute and fit hearing aids throughout the region.

The company grew quickly and between 1950 and 1970 helped many thousands of people with hearing loss to improve their hearing and reconnect with the world around them.

Always at the forefront of technical innovation and customer care, in 1971 Amplifon established the Centre for Research and Studies (CRS). The Centre is a not-for-profit foundation to support scientific and clinical research programmes into hearing loss. To this day, the Centre provides services to ENT (Ear, Nose & Throat) specialists, GPs, paediatricians, neurologists and hearing aid specialists worldwide.

By the 1990s we'd helped millions of people with hearing loss and become a widely trusted name.

Meanwhile, the development of the microchip meant that hearing aids could be made smaller and less obtrusive, with more scope to fine tune and personalise them for individual needs. In 1996, Amplifon began fitting the first fully digital hearing aids.

In 2006 Amplifon acquired The Ultravox Group - an established and trusted brand in the UK since 1961.

Today Amplifon has more than 5,700 specialist centres in over 20 countries around the world staffed with our highly qualified professionals. Our success is global. But it's also very personal and individual.

Our true successes are the millions of people who have had their quality of life improved by what we do, and the way we do it.”⁷

Company Name	Amplifon S.p.a
Address	Via Giuseppe Ripamonti, 133
No. of employees	> 4000
Business sector	Healthcare
Location	Milan, Italy
Company area	Hearing solutions
Department	IT Digital
Start date	1 st September, 2016
End date	31 st May, 2017

Table 1- Key information about Amplifon

⁷ Amplifon Corporate website

4.2 Market Overview

Tony Grant-Salmon from the British hearing aid manufacturer's association has compiled all the available sales figures from Europe for 2015 in this report.

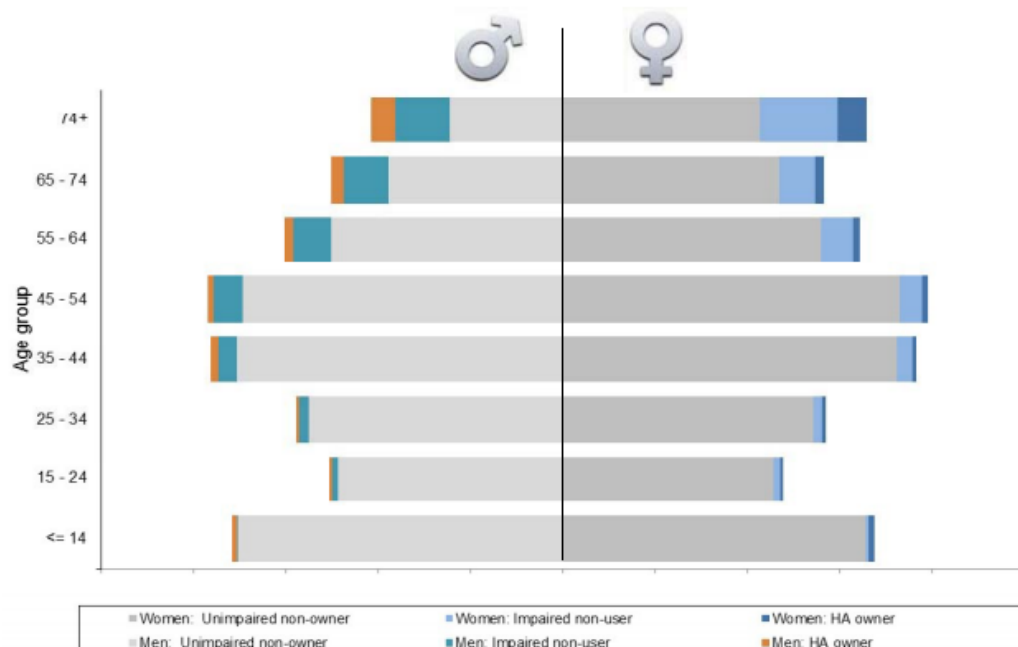
2015 witnessed a 4% increase in sales over the previous year; strong results in The Netherlands, the UK private sector, Italy, France and Switzerland provided the biggest contributions to the increase.

This year's study of hearing aid sales in Western Europe has revealed sales of 3,665,000 units in 2015, a moderate increase of 4.1% over the 2014 figure of 3,519,000 units. It should be noted that this latter figure for 2014 is slightly lower than that reported last year due to updates received after the report was published. The more moderate increase of 4.1% was perhaps to be expected due to the abnormally high increase of 12.2% in the previous year.

Countries making the main contribution to the growth in 2015 were the Netherlands at 13.8%, Switzerland at 11.1%, France at 9.1%, Italy at 8% and UK private at 7.4%.

In Italy, the main reason for the significant growth of 8% is the success of Amplifon which has been much publicised.⁸

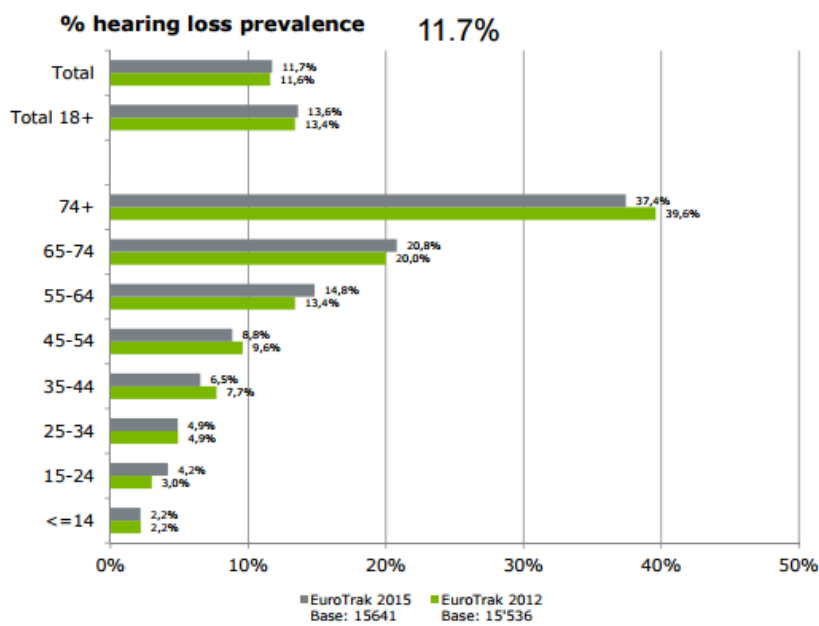
Hearing loss and hearing instrument ownership by gender/age



Graph 1 – Hearing loss and hearing instrument ownership by gender/age

⁸ Source: <http://www.audiology-worldnews.com>

Hearing loss prevalence Italy

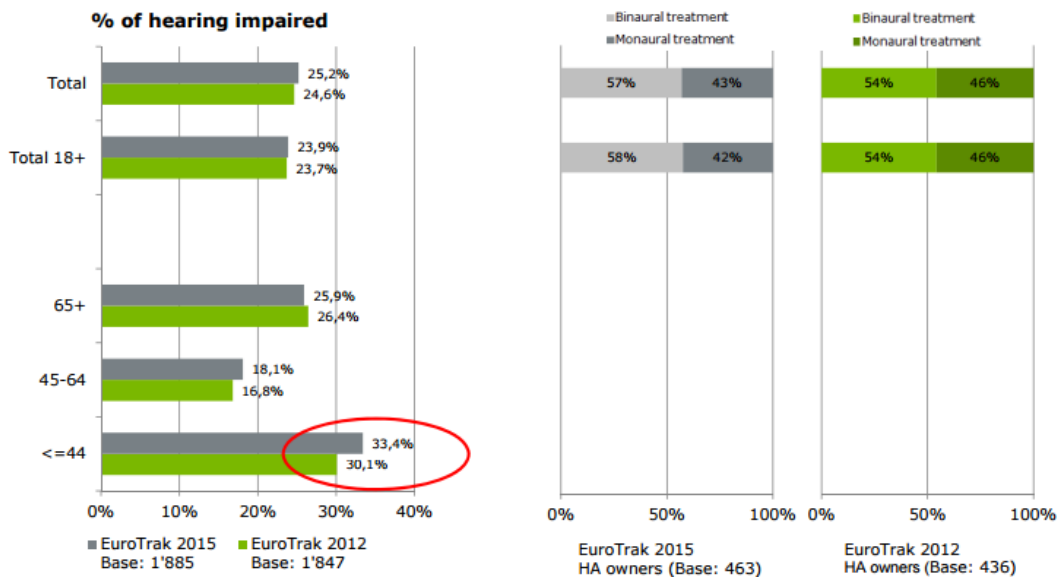


Graph 2 – Hearing loss prevalence in Italy

The above graphs are taken from a market research report created by a company called Anovum. The graphs are fairly self-explanatory and are concerned with the Italian market. It compares the situation in 2012 against the situation in 2015. One can see that there is a huge potential for adoption of hearing aids and that a large percentage of the population tends to be affected by hearing loss.

To wrap this section up, till 2015 only 25% of the affected population used hearing aids. The rest of them preferred going for the binaural treatment.

Hearing aid adoption rate Italy: 25% of hearing impaired have hearing aid(s), 57% of them have binaural treatment



Graph 3 – Hearing aid adoption rate

4.3 Roles and responsibilities

1. Trouble ticket Management

JIRA is the software tool being used at Amplifon. It is used primarily for bug tracking, issue tracking and project management. Some of my responsibilities include monitoring the quality of the tickets raised, creating and configuring different work flows depending upon the project and the participants involved, creating customized search queries, monitoring SLAs of the tickets raised, user management.

The ‘Digital Transformation’ project that is set in motion involves numerous players. JIRA acts as medium between the consultants working for the project and Amplifon’s in house teams. As the project goes through different stages, tickets are raised. Tickets can be raised by anyone involved in the project. They have to be assigned to the right person and can eventually be re-assigned depending upon how the issue progresses. Each ticket has a stipulated time in which it has to be resolved. Heavy penalties are incurred by the consultants if the issues aren’t fixed. JIRA helps us achieve all of the above objectives and helps us to keep a track of the issues and its transitions.

As mentioned earlier, most trouble ticket management software is usually bundled with knowledge base or in other words a wiki. Jira’s is called Confluence. The idea is to populate this space with rich, insightful and useful documents in order to help the people involved in the project. Here in the Amplifon, Confluence is used to house documents such as ‘Functional Specifications’ of websites, user manuals and logs. There is also a section dedicated to roadmaps, which are essential to understand how a project progresses.

Customization is key. Jira is extremely customizable. And this is something that is applicable to most ticket management software packages in the market today. Since it needs to facilitate multiple projects and their respective requirements, Jira can be customized aptly. The 4 main elements of customization so to say, are users (and groups), permissions, types of issues (bugs, action, question, epic, change request etc.) and workflows for each of the issues.

A final note on Jira will be on the plugins that are available from the internal market. It comprises of paid and free plugins like any app store these days. These provide additional functionalities to Jira. Usually they are very specific and unless the user knows exactly what they are doing, it is not recommended to experiment with the plugins.

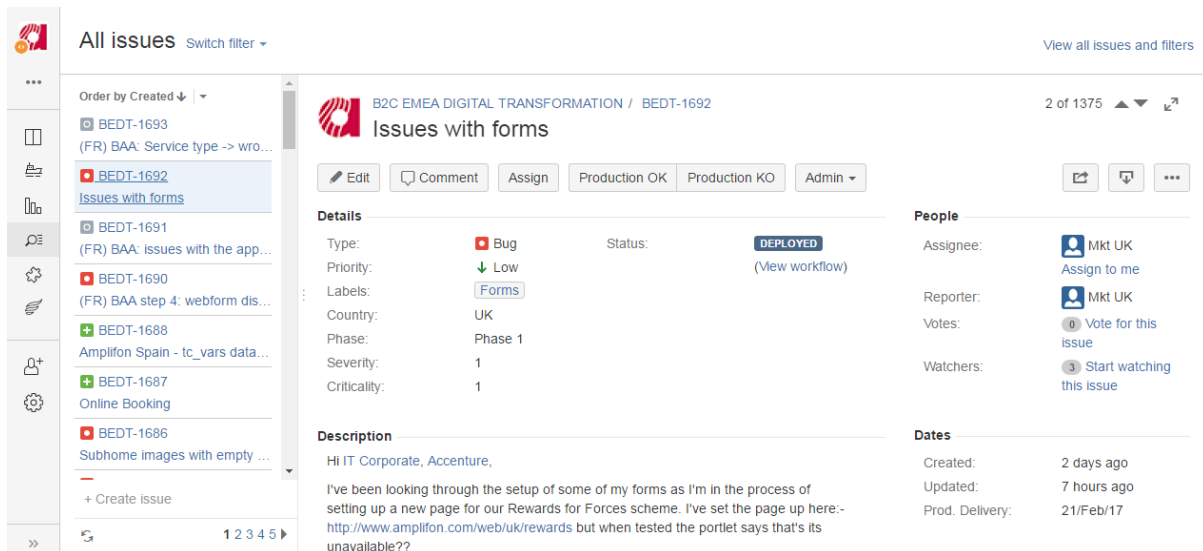


Figure 7 – Opened tickets on JIRA

Above is a screenshot of JIRA in action. On the left one can see the list the issues and on the right is an opened ticket with all the necessary details. On the far right are the people involved, the reporter and the assignee. The opened ticket here is a ‘bug’ issue.

2. Analytics

a. Google Analytics

It is being used to track Amplifon’s numerous websites. In this phase, Amplifon is migrating from old websites to new websites, which is the cornerstone of the ‘Digital Transformation’ project. Apart from this, Amplifon is building new B2C websites. Google Analytics plays a vital role in understanding where the visitors are coming from (including age, gender and location), their behavior (new, returning, frequency and engagement), the technology they use (Android, iOS, Windows, Chrome, etc.). It also monitors acquisition. Which channels (paid, organic, display, others, etc.) have better performance in terms of bringing in the volumes. This enables us (the marketing division especially) to re-strategize in order to make campaigns more effective.

As it provides an aggregated overview of various KPIs, during critical situations such as migration, Google Analytics helps us understand how the migration has affected viewership. The IT team can get hold of such insights to understand what actions need to be taken with respect to the newer websites. So one can see as to why Google Analytics is absolutely imperative. My responsibilities included, creating reports, ensuring preset acquisition goals were met, setting achievable goals (for e.g. number of visitors for the first week).

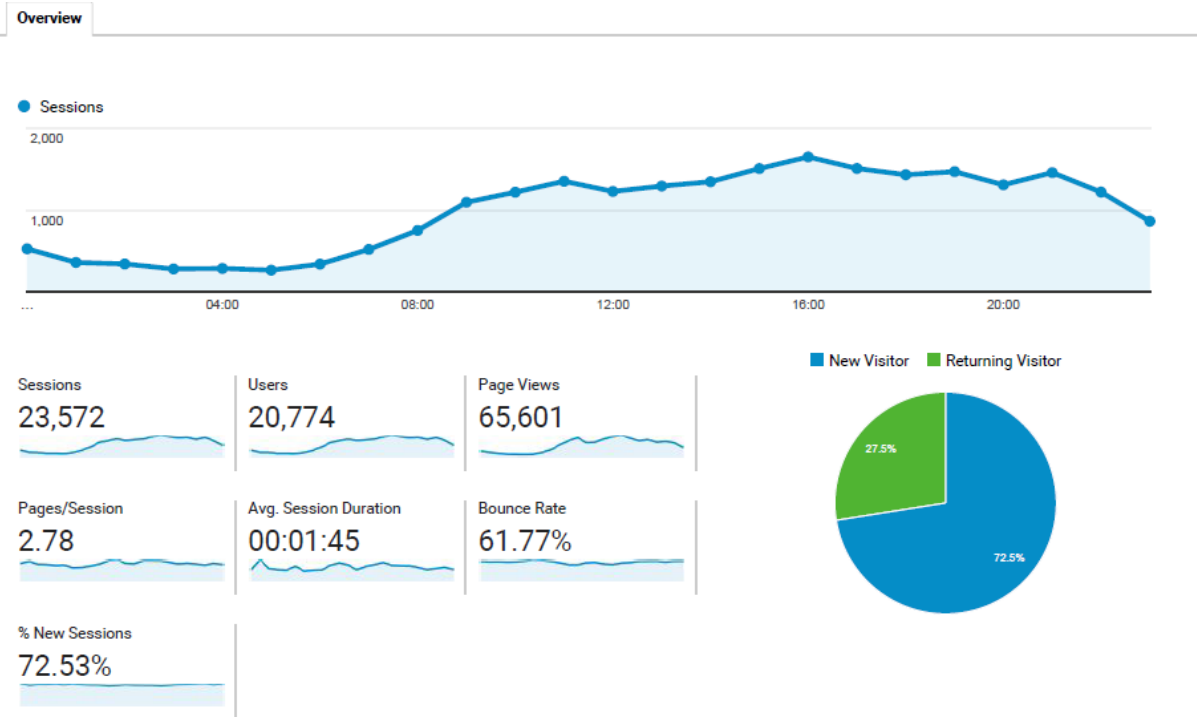


Figure 8 – Google Analytics Dashboard (Audience Overview)

The above screenshot shows the audience dashboard. It shows KPIs related to audience such as sessions, users, page views, etc. This is one of the most frequently used dashboard here at Amplifon.

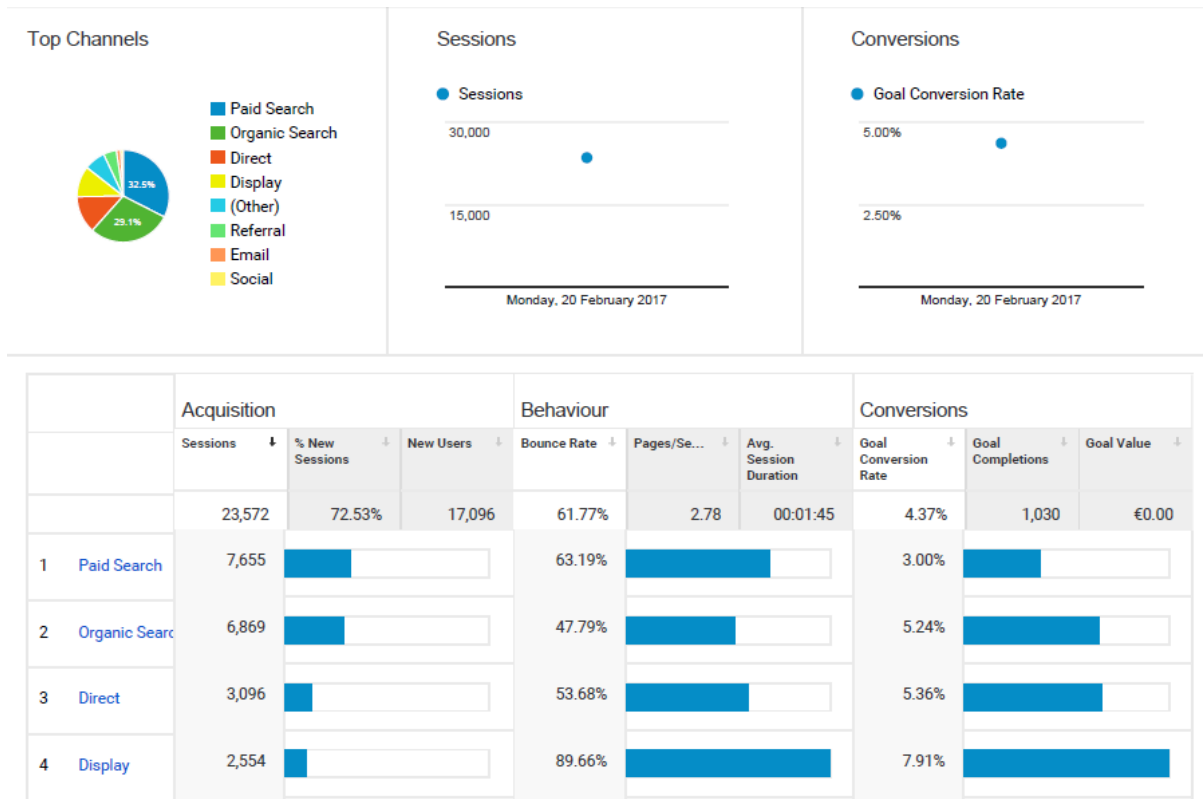


Figure 9 – Google Analytics Dashboard (Acquisition Overview)

The second dashboard that we use frequently is the acquisition dashboard. This shows us from where our viewers are ‘channeled’ to our websites. The shares of different channels are also represented to give the user a comprehensive overview of how the different channels are performing.

b. Dynatrace

Dynatrace is an American application performance management (APM) software company with products aimed at the information technology departments and digital business owners of medium and large businesses. The company's services include performance management software for programs running on-premises and in the cloud. This software manages the availability and performance of software applications and the impact on user experience in the form of deep transaction tracing, synthetic monitoring, real user monitoring, and network monitoring.⁹

Every website of Amplifon is tracked by Dynatrace. It is a very powerful tool, which is essential for constantly checking the performance of the websites. I was configuring different dashboards on Dynatrace for Amplifon. These included plotting graphs such as number of visitors vs. load time of websites, overall visits vs. response time and overall visits vs.

⁹ Source: Wikipedia

response time per browser vs. device vs. OS. One another constant task was constantly checking the website performance for consistency and highlighting anomalies. Dynatrace helped in maintaining the quality of the websites. After some research, each website tracked was configured with a custom alarm with respect to the number of visitors i.e. should the number of visitors drop below X, my alarm would immediately highlight the anomaly. A KPI that we closely follow is the response times. In simple words, how quickly the website loads. It is fairly self-explanatory as to why it is such a critical KPI. Dynatrace can also help us zero in on what the issue is if the website isn't loading fast. For instance, we could drill down and see if the user had a problem with the internet connection. And if that turns out to be true, then the website performed badly because of the bad connectivity. Possessing such knowledge can help the IT team better collaborate with the consultants and service providers. During times of crisis, Dynatrace can help quickly identify what the issue is and corrective measures can be taken to prevent further damage, be it bad load times, website breakdowns, etc.

To summarize, Dynatrace Application Monitoring is a product which helps developers, testers and operations to ensure their applications work fast and reliable. The core technology of the product is its patented "PurePath Technology" which allows us to trace every single transaction (like a web request, user interaction, batch jobs etc.) from end-to-end (browser to database). Dynatrace is also monitoring your whole infrastructure and with that set of information let you to figure out if there are any application performance problems and if they're related to infrastructure (virtual or physical), app server, web server, app code, database or any other tier.

Application performance monitoring tools are essential for organizations that are committed to providing consistent and exceptional user experiences. Applications today are more complex and distributed than ever, and maintaining performance is increasingly difficult. And user expectations have never been higher – everyone who uses an application expects that it will work flawlessly and respond quickly to every click.

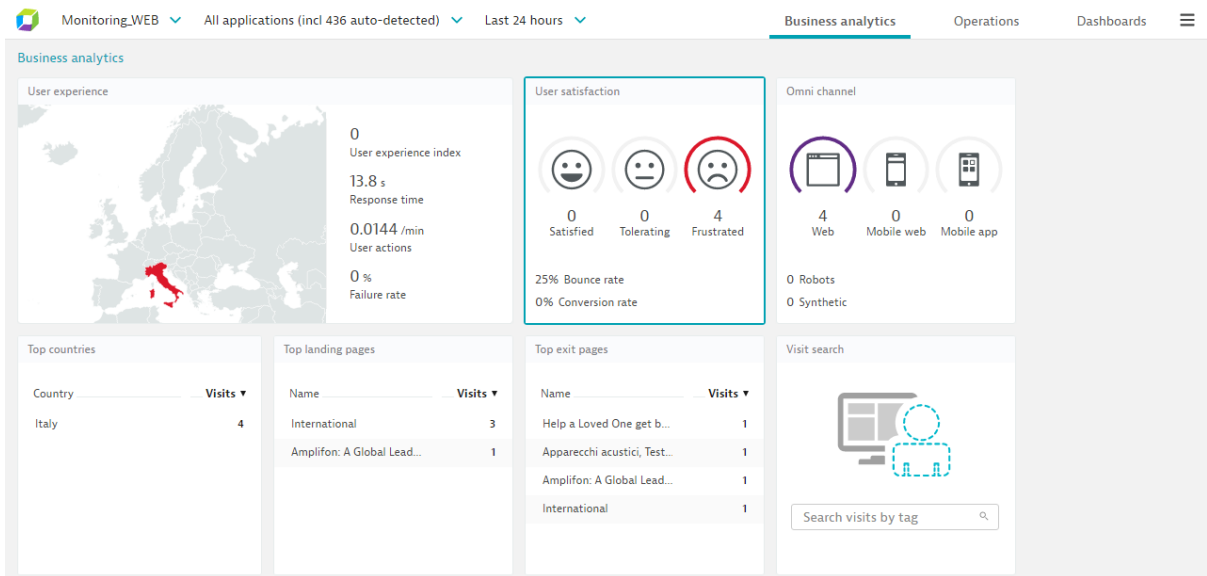


Figure 10 – Business analytics dashboard(web)

This dashboard is the web client of Dynatrace which presents an overall picture of the ‘health’ of the system. It is a one stop comprehensive view of how the systems are performing. It also presents the user satisfaction metric which is a significant KPI to be addressed from a digital project perspective.

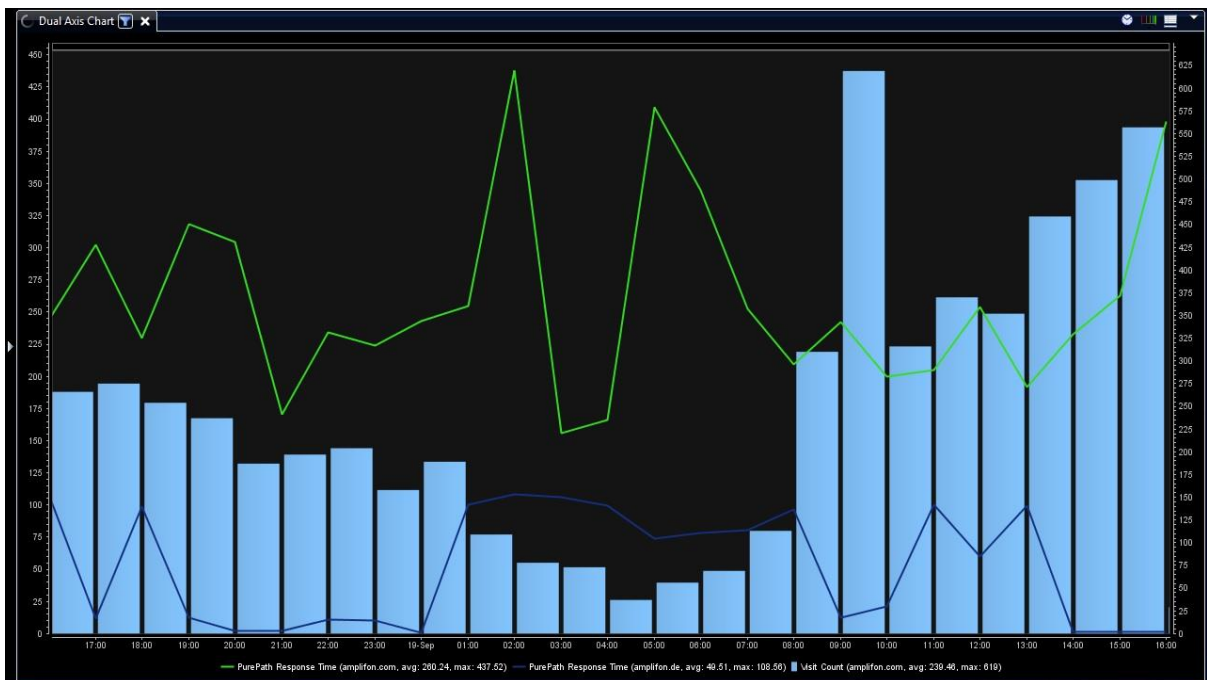


Figure 11 – Response time and visitors plot from Dyantrace(Offline client)

The above dual axes chart is from Dynatrace. It depicts the response time (line graph) of one of our websites during various times of the day and the number of visitors (bar graph) to that website. Graphs such as these can show us how the websites work when under high stress (increased traffic) and helps us better prepare for such situations.

c. BRIGHTEDGE

It is a content performance marketing tool. It basically monitors how well the content of the website is doing, in other words, how well it is search engine optimized. Amplifon has websites in different languages (considering they have their presence in 21 countries) and it is a herculean task to keep the content in check. BRIGHTEDGE helps ease the process. BRIGHTEDGE offers in depth analysis on how the content is performing by itself and also against other competitors. It also performs some of the same functions as Google Analytics, but offers a better perspective. One of the features of BRIGHTEDGE that I extensively use is called the DataMind. It uses deep learning techniques to draw out insights that would help marketers create content faster and with greater precision. And by tearing apart and training the data, they've uncovered insights over the years -- such as brand vs. non-brand search behavior, content classification and the impact of intent on the search experience. What this translates to is the quality of the content can be evaluated and improved constantly to ensure the websites are highly search engine optimized.

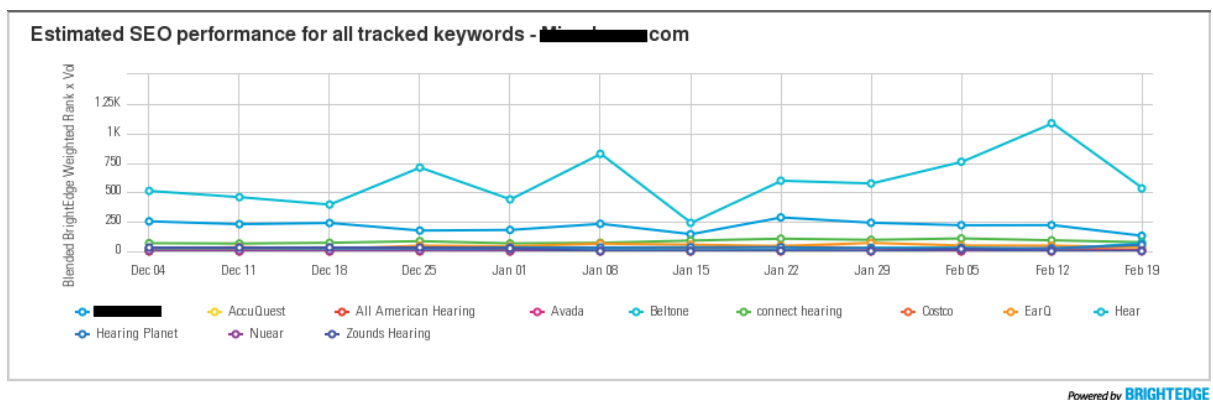


Figure 12 – SEO performance

The graph above pits the SEO performance of one of our sites against the competitors. As you can see, the performance is observed over long periods. This helps to understand (should things go wrong), when exactly it happened. We can also see the performance of our direct competitors, which is truly insightful.

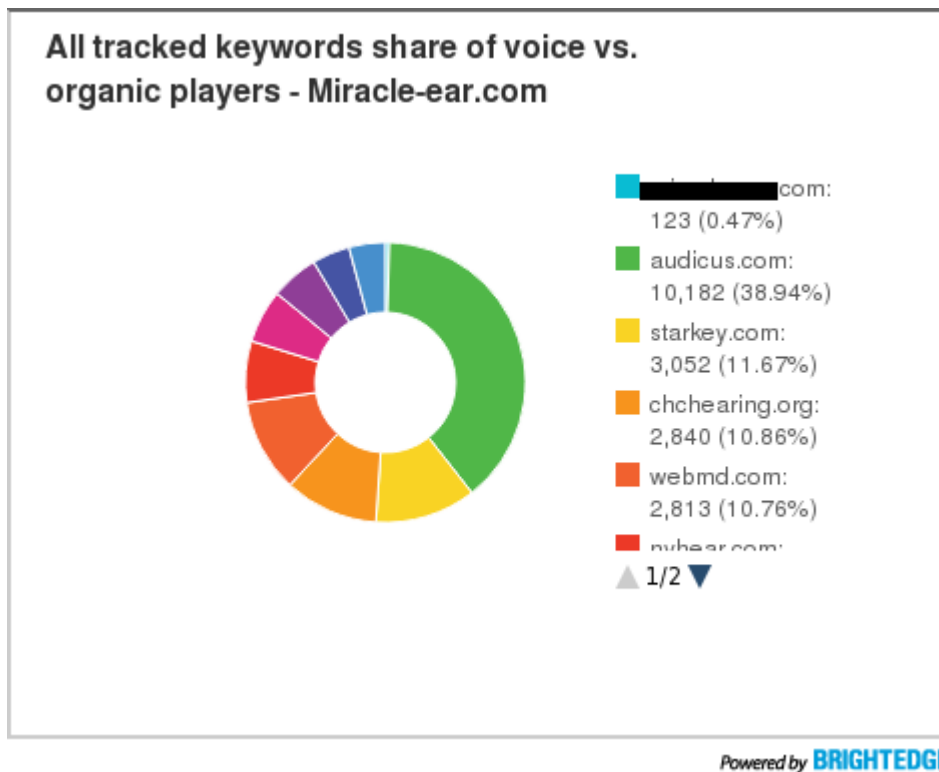


Figure 13 – Share of voice pie chart

The pie chart above depicts the all tracked keywords share of voice (Share of Voice in Online Advertising is an ad revenue model that focuses on weight or percentage among other advertisers. For example, if there are four advertisers on a website, each advertiser gets 25 percent of the advertising weight) in organic players' scenario.¹⁰

3. Development

a. Liferay

Liferay Portal is a free and open source enterprise portal software product. Written in Java, Liferay Portal is a web platform with features commonly required for the development of websites and portals. Liferay includes a built-in web content management system allowing users to build websites and portals as an assembly of themes, pages, portlets/gadgets and a common navigation. Liferay is sometimes described as a content management framework or a web application framework. Liferay's support for plugins extends into multiple programming languages, including support for PHP and Ruby portlets.¹¹

Amplifon had decided to use Liferay for building all of their new websites. This is primarily because the content of the websites is different for different countries. Liferay helps in decentralizing content contribution and management. Some of my activities include

¹⁰ Source: Wikipedia

¹¹ Source: Wikipedia

overlooking the entire process of content contribution, working with the different departments and understanding their requirements. In the long run, the idea is to develop skills in order to be able to completely develop websites from scratch and implement the same i.e. to develop internal competency with respect to Liferay development and be able to create and provide support as and when necessary.

4. UAT

As mentioned earlier, Amplifon is in the middle of a massive digital transformation phase. This means a lot of different websites are being developed, especially B2C ones. Every website must be tested exhaustively, before the “go-live” happens. I have to ensure that the test-books we receive are comprehensive and then carry out the testing of these websites along with some external service providers.

Test name	Objective	Step	Description	Expected Result	Test Passed	Test cycle	Malfunction description	Severity	Tester	Test Data (url, browser...)	Owner	Status	Effort	Not
Appointment Booking	Verify functionality and layout of the Appointment Booking process	Step 0	Access to the website	Loading of the homepage	YES									
		Step 1	Verify that the Appointment booking page can also be reached by clicking the button "Book an appointment" in the header	Loading of the Appointment booking page	YES									
		Step 2	Verify that the Appointment booking page can also be reached by clicking the button "Book an appointment" in MyAgenda section	Loading of the Appointment booking page	YES									
		Step 3	Verify that the Appointment booking page can also be reached by clicking the	Loading of the Appointment booking page (BAA Light)	YES									

Figure 14 – Actual UAT book

The spreadsheet above is what a test book usually looks like. They pretty much contain pointers that are necessary to put the website through its pace before they are made live. Think of it as a check list. Once all the functionalities have been tested (and fixes made if necessary), the test book is signed off and the website is ready for launch.

CHAPTER 5 Conclusion and Inferences

To put simply, the report was created to offer insight as to how a massive digital migration occurs with large scale implementation. The concepts were highlighted under literature review. Their applications were observed in the empirical analysis chapter. All of this, complemented by the supportive frame works.

Although strategies and management of the projects of a digital nature will depend on numerous factors such as internal competency, budget, time, resource allocation etc. we can try to broadly highlight certain conclusions that we can deduce from the research carried out in this report.

I. Analytics.

It has a broad range of applications. But from the purview of the report, the applications are limited to the IT and marketing segments.

We have already seen how analytics helps the IT infrastructure. Enhanced analytics capabilities will offer any institution the ability to understand its customer base and make personalized offers based on individual, household, risk, and/or business relationships — improving share of wallet with existing customers and attracting new customers through product and service differentiation. Predictive analytics will further enable real-time decision making to consumers who already benefit from instant gratification at retail stores, for instance, a perfect example of playing a role in the customer journey. First movers in deploying predictive analytics have a competitive edge in the market.

II. Create a modern datacentre.

This secular shift requires and is propelled by a fundamental IT transformation, which embraces cloud as a primary IT architecture and consumption model, to manage millions of devices and the data deluge associated with them, to create large data lakes and enable - for example - predictive services. This all creates the need for a modern datacentre architecture to overcome the information siloes and rigid IT infrastructure that limits transformation and the implementation of a hybrid cloud IT infrastructure.

Hybrid cloud infrastructure is in fact a key enabler of digital transformation as it supports mobile and cloud-native workloads as well as the existing business-critical and legacy workloads. At the same time, it supports innovative projects initiated by the business. It is important that CIOs evaluate which workloads and data should move to the cloud so that the benefits of scalability, agility and service-based IT delivery are maximized. A strong business case should always be developed before data is moved between environments to ensure that it is being moved for the right reasons.¹²

III. Choose the right tech provider.

The final element needed for effective digital transformation is a technology provider that matches the ambition of the business and will be relevant in the long term.

To be effective and successful partners to their customers, technology providers must provide support for a strategy and governance framework that spans operating model, infrastructure and applications, delivering measurable results in each phase of implementation to then also transform leadership and customer experience. This will truly help CIOs to thrive in the digital era.¹³

IV. Global projects of innovative digital solutions require more than traditional methods of project management phases. Managing human relations, even in the most difficult cases of virtual teams, is the most important aspect of achieving the goals.

V. Companies undergoing traditional business transformations have tended to adopt a sequential approach to acquiring the skills and tools they need. Talent and technologies are brought in based on software-release initiatives that are rigidly scheduled; nothing is rolled out to customers before it is fully complete. This approach is inadequate for digital transformations; by nature, these projects are iterative and call for continual clarification of targets and hence updates to internal requirements. One of the important advantages of digitization, after all, is that companies can capitalize on opportunities for end-to-end customer-centric innovation, where targets are constantly refined and experimentation is encouraged. Using this approach, for instance, a company might want to update its online offerings with new functionality more frequently (say, every week) and introduce them one by one—gathering feedback from customers and revising its website in a test-and-learn fashion—rather than launching all front-end and back-end changes at once.¹⁴

The conclusion is limited in the sense that they were made after having observed only one single company, but such is the nature of this report. Needless to say, it is very difficult to have a one-solution-for-different-situations. The conclusions are to act as guidelines and provide some insight into activities and management styles being put into everyday use in an established company.

^{8&13} itportal.com

¹⁴ Source: <http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/acquiring-the-capabilities-you-need-to-go-digital>

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