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CONSULTANCY FOR PUBLIC BENEFIT

Network Restructuring – Elaboration of IT roadmap

IT Roadmap

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Today's objective is to agree on the basis of REF IT Roadmap

- **Discuss the IT Actions of REF**
  - The main activities to be defined for
    - Infrastructure
    - Applications
    - IT organization
    - IT security
- **Discuss the main alternatives regarding integrated solution**
- **Discuss the proposed IT Roadmap**

Agenda

- **Methodology**

- Future IT

- Actions towards future IT

  - IT Infrastructure

  - Applications

  - IT Organization

  - IT Security

- Integrated solution - Discussion

- Proposed IT Roadmap

- Next steps

During the second phase we prepare the IT Roadmap for the organization

AS-IS Analysis	Development of IT Roadmap

Main tasks	Methodology

Identification of high level directions of REF IT:
- Identify the target state of future REF IT
- Assessment of potential directions towards the development of IT.

Preparation of IT vision with details about:
- Role of IT in the future,
- IT organization,
- IT strategy (e.g.: Insource/outsource, cloud),
- Assessment of potential future developments.

Roadmap development:
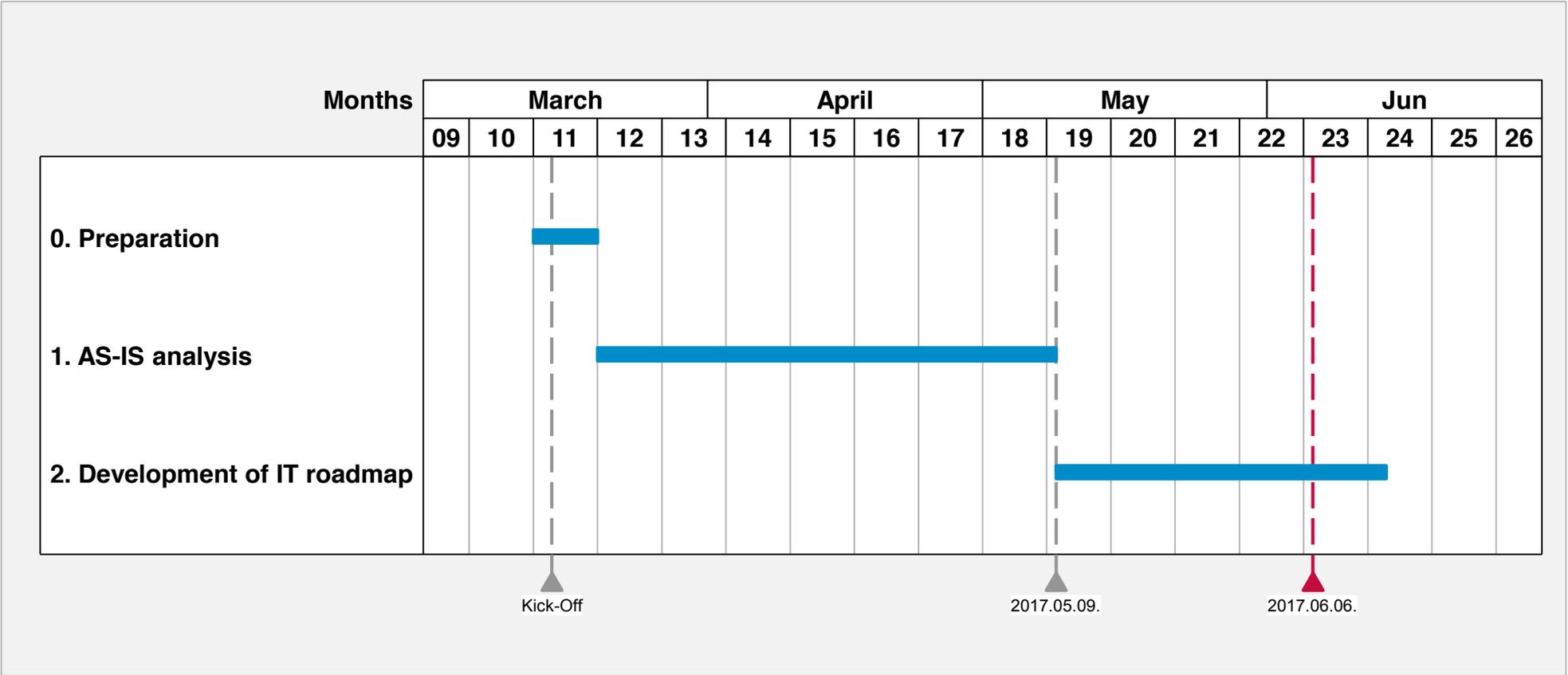- Preparation of IT roadmap, based on selected developments and actions, scheduling.

- Interviews, previously collected information and Workshops will represent the basis of IT vision development.
- Directions and IT vision will be finalized in a Workshop.
- Defined actions will be discussed with project participants and will be finalized during a Workshop.

Results, deliverables

- IT Roadmap document, including:
  - Level of future IT support for REF;
  - IT organization;
  - Future hardware and software environment;
  - IT security related developments;
  - Roadmap: Scheduled actions and activities which are enabling the reach of IT vision.

We are on track with the project

Months	March				April				May				Jun			
	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

0. Preparation

1. AS-IS analysis

2. Development of IT roadmap

Kick-Off   2017.05.09.   2017.06.06.

Workshops (proposed dates)

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Business requirements will determine the key cornerstones of IT Roadmap development

Applications

A unified, integrated solution should support REF's business processes and reporting.
Introduce clear, unified separation between the use of each application (collaboration, archives, workflow/task management, reporting etc.).
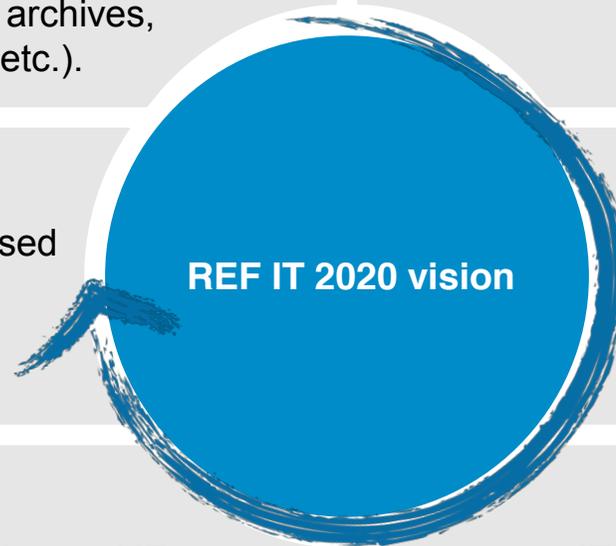
Server Infrastructure

Internal Server Infrastructure to be moved into the cloud. (Infrastructure and Platforms should be hosted at a cloud provider).

User devices

Devices are changed continuously, based on age and condition.

IT Procurement

No changes or modifications will be expected.

REF IT 2020 vision

IT organization

At this size of operation, the mix of an internal IT expert and a professional IT outsourcing partner is reasonable for the future.
Application support and maintenance to be outsourced and provided by a professional vendor.

IT Security

IT Security guidelines and General IT Manual (incl. Device mgmt., inventory, licenses, maintenance processes, etc.) to be defined and introduced at REF.

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Most of the applications are hosted by professional service providers, however file server is in-house, running on an outdated OS

In-house server

- **There is an in-house server at REF office, which runs as a file server,** external offices can connect to it via VPN access.

- In-house server is maintained by an external hosting provider.

- **Running on a Windows 2003 Server**, which is outdated and **recomme** **upgrade.**

Hosted servers

- **Virtual servers** are hosted on an external hosting provider's infrastructure. Applications hosted: **Exchange, GMS system**.

- **OAS application servers are located at Intalion**, maintenance is done by Intalion staff.

REF decided to move its server infrastructure into the cloud. Role of current hosting provider is still an open issue.

REF's servers have professional maintenance, done by an external partner.
The organization's main objective is to move the in-house file server into the cloud.
It is recommended to upgrade server OS of the in-house server in case it will be used later on.

Devices are good quality, but there is no formalized guideline or policy for replacements

	Quantity	**Categories**	**Proposed replacement**	
Desktop PC	10	4 (Dell), 2 (Lenovo), 2 (HP), 1 (Apple), 1 (Gigabyte)	**5 yrs** (display: until obsolete)	
Landline phone	19	19 (Landline phone)	**until obsolete**	
Notebook	32	25 (Lenovo), 5 (HP), 1 (Apple), 1 (Tablet)		
Printer	1	1 (Canon 4225i)	**until obsolete**	
Mobile phone	8	5 (Apple), 3 (Samsung)	**2 yrs**	

> REF's IT principles, guidelines for hardware replacements are under development.

Some devices vary in type, which could result higher maintenance costs.

It is recommended to have a detailed up-to-date list about the hardware elements (age, type, etc.).
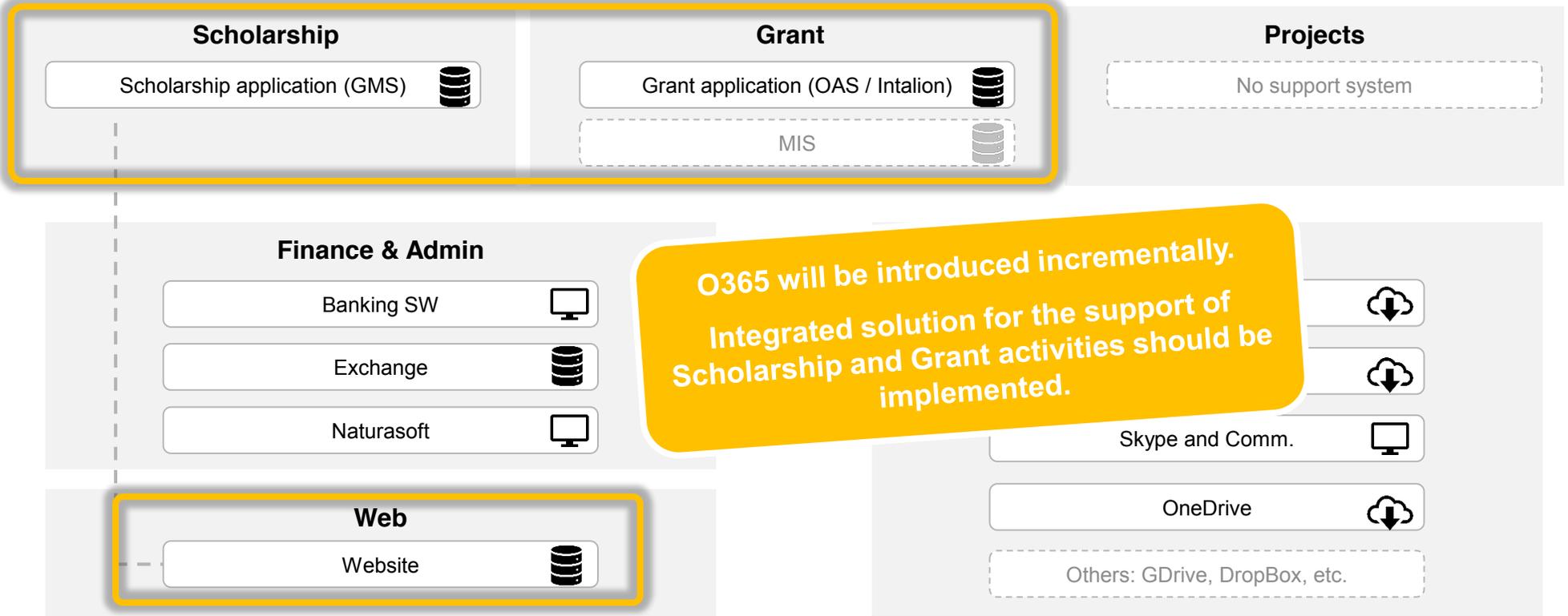
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There is a lack of integration between REF's applications

AS-IS Business System Landscape of REF

Scholarship	Grant	Projects
Scholarship application (GMS)	Grant application (OAS / Intalion)	No support system
	MIS	

Finance & Admin

- Banking SW
- Exchange
- Naturasoft

- Skype and Comm.
- OneDrive
- Others: GDrive, DropBox, etc.

Web

- Website

> **O365 will be introduced incrementally.**
>
> **Integrated solution for the support of Scholarship and Grant activities should be implemented.**

There is no central database which could support REF's reporting needs.
Lack of integration and the use of diverse applications can cause ineffective operation.
Office 365 is under consideration in order to have more flexible use of Office Applications (incl. Exchange).

Focus of future developments, actions.
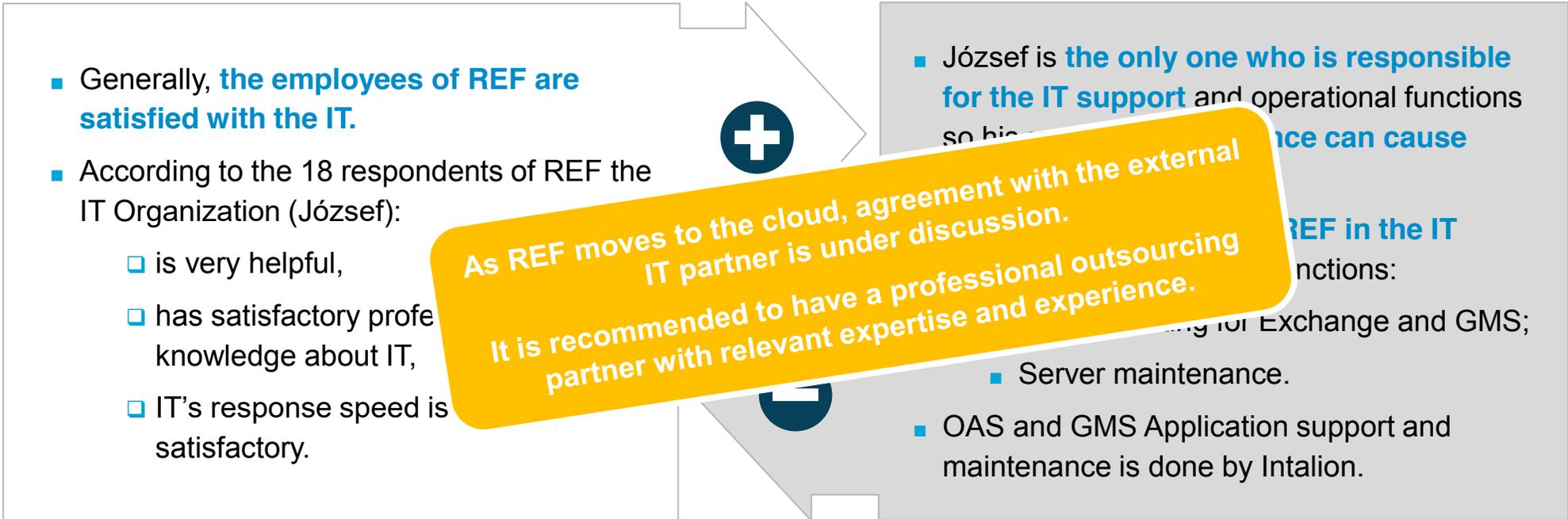
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Generally, the employees of REF are satisfied with the IT

- Generally, **the employees of REF are satisfied with the IT.**

- According to the 18 respondents of REF the IT Organization (József):
  - ❏ is very helpful,
  - ❏ has satisfactory profe[ssional] knowledge about IT,
  - ❏ IT's response speed is satisfactory.

- József is **the only one who is responsible for the IT support** and operational functions so his [...] **ce can cause** [...]

- [...] **REF in the IT** [...] [fu]nctions:
  - [...]g for Exchange and GMS;
  - Server maintenance.

- OAS and GMS Application support and maintenance is done by Intalion.

As REF moves to the cloud, agreement with the external IT partner is under discussion.

It is recommended to have a professional outsourcing partner with relevant expertise and experience.

It is recommended to have the external partner be prepared for the situations when József is not reachable or absent. (e.g. preparation if IT related documents, infrastructure elements, databases, etc.)

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There is a significant room for improvement in IT Security

IT security has not been in focus at REF during recent years; there were limited guidelines, trainings and antivirus solutions.

Since REF is handling personal (or sensitive) ~~information~~ ... ~~the~~re is a **significant risk in not** ...

REF IT security principles and guidelines are under construction.

Trainings will be held for the staff, in order to improve security awareness.

Based on the ~~interviews~~, **there were security incidents in the past** which caused **data losses** on the file server.

It is recommended to develop general IT security guidelines and trainings for REF employees in order to raise the security awareness of the organization.
Proper antivirus solutions are also necessary for the future.

IT security is not just a technology issue

Technology

- **Problem**: Nowadays the IT infrastructure of an organization can be easily targeted by (mostly automated) attacks from the internet. It is very important to harden firewalls, servers and network elements.

- **General recommendation:** Have a regular (yearly) IT Security audit – performed by a 3rd party - for specific topics, in order to evaluate the IT Infrastructure from security viewpoint.

- **Specific recommendation:** IT security should be an important aspect during the development or selection of the integrated solution.

Organization

- **Problem**: There is no responsible person for IT security nor any IT security policy available at REF.

- **General recommendation**: It is recommended to have a responsible person internally for IT Security and data security. This person will be responsible for the preparation of policies and guidelines and also for regular trainings.

Trainings

- **Problem**: Low level of IT and data security awareness amongst employees.

- **General recommendation**: Employees should be attend to an IT Security training after REF IT Security policy has been finalized. Also regular notifications can be improve awareness (e.g.. Monthly email).

OF ALL THE SCARY THINGS THAT CAN SABOTAGE A NETWORK, THIS ONE IS BY FAR THE DEADLIEST.
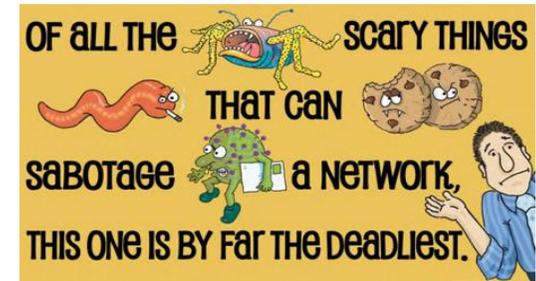
IT security should be developed by every aspect.

Some samples to develop the affinity of IT Security in the organization

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A development need regarding an integrated core application has been formalized during the interviews

Objectives and assumptions

Clear objectives should be defined regarding the „common platform", which can drive the implementation process:

- Create the „Single source of truth"
- Data integration
- Vendor independence
- Unified processes
- Etc.

According to most recent information, **development of current Scholarship application (GMS) can unlikely be cost efficient**, because of the following:

- Old, fragmented code base with low level of documentation;
- Stability, maintenance and support is an issue with the system.

Potential alternatives for REF*

0. Everything remains the same *(technical alternative)*

- Everything remains the same, both systems will be maintained but no or minimal developments will be made.

1. Two core applications

- Current Grant application will be developed in order to fulfil business requirements, Scholarship application will be replaced by a new system.

2. One core application

- Grant application will remain and will be developed in order to fulfil all business requirements, Scholarship application will be stopped.

3. Green-field core application selection

- Out-of-the-box solution or custom development which can cover all the REF's core functions and fulfil all business requirements.

* #1 and #2 alternatives have been modified based on the assumption that GMS has to be stopped and replaced. ☐ *Alternatives selected on Workshop (06.06.2017).* © IFUA Nonprofit Partner

If everything remains the same, current problems will stay with REF, and potential new problems can occur

Alternative rejected on workshop (06.06.2017)

| 0. Everything remains the same	■ Everything remains the same, both systems will be maintained and zero or only minimal developments will be made.

Pro

- Low CAPEX needs (amongst scenarios).
- There is no shock on organization.
- No need for trainings.
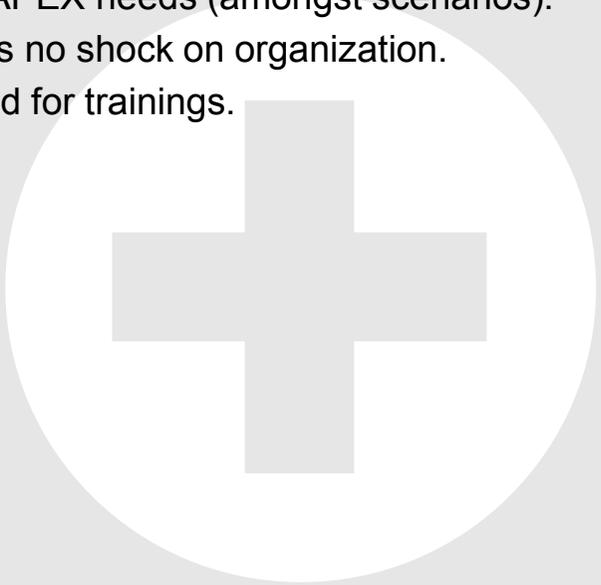
Contra

- Inhomogeneous application map with high maintenance risks and costs.
- Moderate or high OPEX needs (amongst scenarios) based on direct and indirect effects.
- There won't be any true integrated solution for the core activities.
- Systems are not future proof solutions.
- Significant operational risks can occur.
- No or low level of integration.
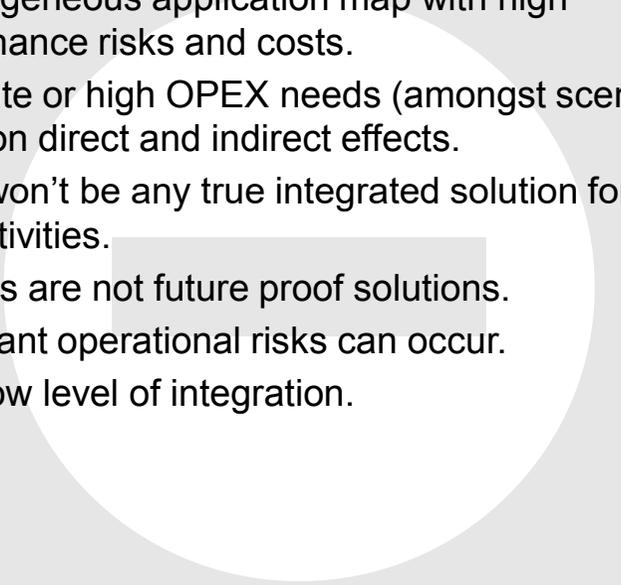
Next step, if the scenario is chosen ➤ *Necessary development needs, and bug fixes to be collected internally for each system, then alignments with Intalion or a 3rd party vendor.*

Current Grant application (OAS) stays with developments and Scholarship application (GMS) will be replaced to a new system

1. Two core applications	■ Current Grant application will be developed in order to fulfil business requirements, Scholarship application will be replaced. ■ *Assumption: Developments cover integration, stabilization and function development/fine tuning.*

Pro

- It solves the problem of limited functionalities.
- Solves the problem of low integration.
- The scale of development is moderate.
- The organization have experiences with the systems, minimal shock is expected on organization.
- Operational risks are handled by developments.
- Moderate time and effort needed for user tests.
- New GMS solution can be future proof, *(with a potential in integrating OAS functionalities later).*
- Timeframe of implementation is probably the shortest.

Contra

- Moderate-high CAPEX needs (amongst scenarios).
- Moderate OPEX needs.
- Inhomogeneous application map with higher maintenance costs.
- Support and maintenance needs will remain for both developed systems.
- Future developments can be harder to manage, because of different applications (and/or platforms).
- More complex integration issues can occur, cost of integration is relatively high in this scenario.

Next step, if the scenario is chosen	*Business requirements and non-functional requirements to be collected, options to be defined for GMS (Scholarship application) replacements (market research on systems, market research on potential vendors), then RFI or demo to be asked.*

Only one system will remain (current Grant application), all core processes will be developed into this system

Alternative rejected on workshop (06.06.2017)

2. One core application	■ One core application – (current Grant application – OAS) – will be developed in order to fulfil all business requirements, the other will be stopped. ■ *Assumption: Developments cover integration, stabilization and function development/fine tuning.*

Pro

- Low or moderate OPEX needs.
- It solves the problem of limited functionalities.
- Solves the problem of low integration.
- The organization have experiences with the system.
- Future developments can be managed and coordinated easily.
- Maintenance and support is relatively simple.
- Operational risks are handled by developments.

Contra

- High CAPEX needs (amongst scenarios)
- The scale of development is significant.
- No future-proof solution.
- Relevant shock on organization, during development phase.
- System is still not ready.
- Significant time and effort needed for user tests.
- Moderate technology related risks during development (base on chosen system's technology debt.
- Technology dependent alternative *(in terms of: vendor, supplier, functionality).*
- Timeframe of implementation is relatively long.

Next step, if the scenario is chosen

Business requirements and non-functional requirements to be collected, development needs to be discussed with OAS's (current Grant application) vendor, Intalion or with a 3rd party.

Third scenario represents a total new system, which will be selected in order to support Grant and Scholarship activities

3. Green-field core application	■ Out-of-the-box solution or custom development which can cover all the REF's core functions and fulfil all business requirements.

Pro

- Low or moderate OPEX needs (amongst scenarios).
- It solves the problem of limited functionalities.
- Solves the problem of low integration.
- Future proof solution.
- Future developments can be managed and coordinated easily.
- Maintenance and support is relatively simple.
- Operational risks are handled by developments.

Contra

- Significant CAPEX needs.
- Significant shock on organization during development phase and user testing phase.
- Significant time and effort needed for specification.
- High risk development.
- Timeframe of implementation is relatively long.

Next step, if the scenario is chosen	*Business requirements and non-functional requirements to be collected, options to be defined for replacements (market research on systems, market research on potential vendors), then RFI or demo to be asked.*

During the IT roadmap workshop the participants have chosen two potential scenarios to go with

	0. Everything remains the same	1. Two core applications	2. One core application	3. Green-field core application
1. CAPEX*	▪ Low CAPEX needs	▪ Moderate-high CAPEX needs	▪ High CAPEX needs	▪ High CAPEX needs
2. OPEX*	▪ Moderate-high OPEX needs	▪ Moderate OPEX needs	▪ Low or moderate OPEX needs	▪ Low or moderate OPEX needs
3. Implementation timeframe (estimation)	▪ n/a	▪ Shortest	▪ Long	▪ Long
4. Operational Risks of implementation	▪ n/a	▪ Low	▪ High	▪ High
5. Stress on organization	▪ n/a	▪ Low	▪ Medium	▪ Very high
6. Future proof	▪ No	▪ Yes	▪ Probably	▪ Yes
7. Integration	▪ Integration is not handled	▪ Integration is an effort	▪ Handled by design	▪ Handled by design

Preliminary estimations; TCO calculation is recommended to be done based on proposals. ▢ *Alternatives selected on Workshop (06.06.2017).*

The following aspects are proposed to be taken into consideration

1. Two core applications

- Current Grant application (OAS) has to be developed in order to fulfil all the relevant requirements:
  - Does REF believe that current vendor will be capable of this development?
  - Does REF believe in future cooperation (development, maintenance & support) with current vendor?
- Integration, or integrated data layer has to be planned.
- Scholarship application can be relatively quickly replaced, therefore there is no need for interim scholarship solution.

3. Green-field core application

- It is recommended to have significant management attention on vendor selection and on future implementation.
- Implementation of this alternative will have relevant stress effect on organizations.
- Integration can be handled by design.
- Most probably scholarship functions will be accessible on a longer timeframe:
  - Interim solution may need in order to mitigate operational risk regarding current scholarship application.
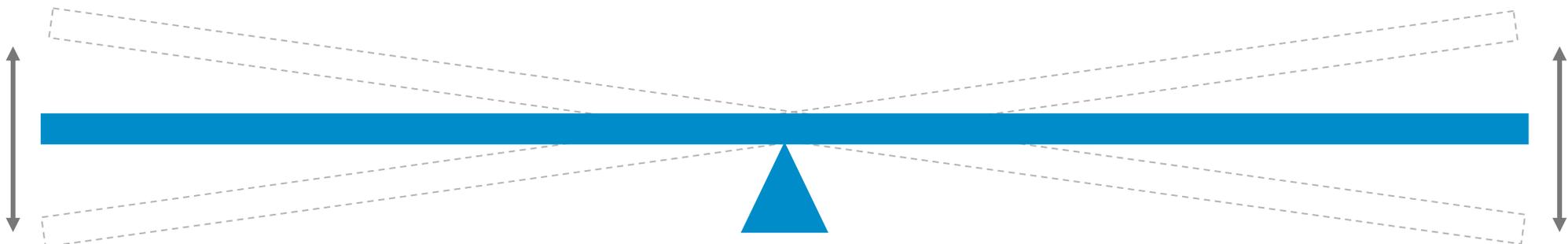
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Action list was developed in order to create the IT Roadmap for REF (I/II)

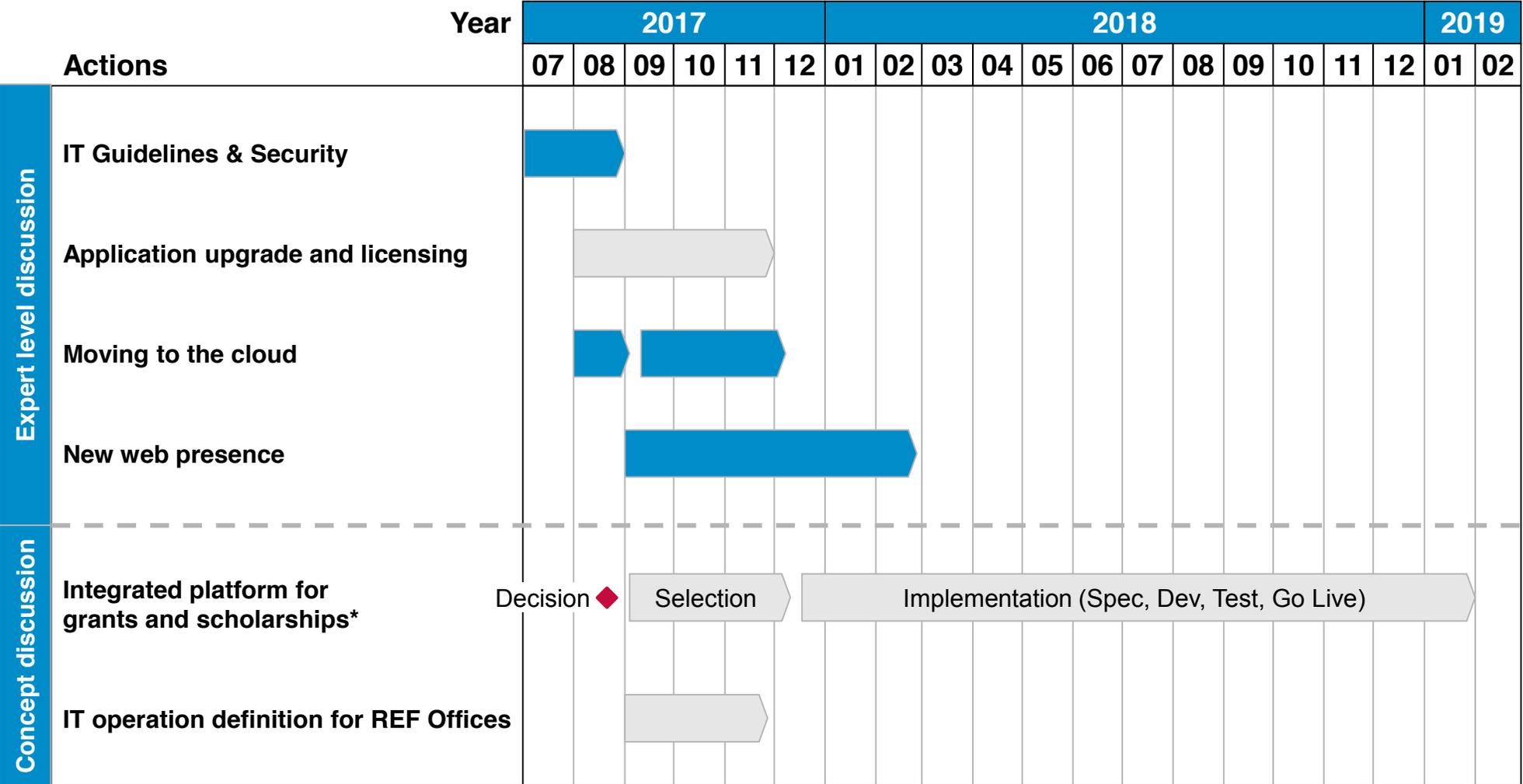| Category	Duration	Description
IT Guidelines & Security	**2 months**	■ Creation of a comprehensive IT Guidelines and IT Manual containing the most important rules of REF IT which have to be followed. 　■ This Manual contains: use of applications, management of authorities, data/document saving policy, file and library management, data protection policy, IT security rules etc. ■ To organize IT trainings in order to have a better knowledge about IT security. ■ **GDPR related REF activities and processes should be analyzed.**
Moving to the cloud	**1 month + 3 months**	■ The goal is to have everything in a Cloud storage system. The movement of the servers to cloud contains the phases. 　■ 1. phase: Movement of the file server into the cloud 　■ 2. phase: Movement of the applications (OAS, GMS) and its data into the cloud. ■ Agreement with outsourced partner should be reevaluated, roles and responsibilities to be discussed for future operation.
New web presence	**6-8 months**	■ A brand new up-to-date webpage should be developed as the current webpage is outdated and it does not provide the necessary information for the applicants of REF's programs.
Create a common platform for grants and scholarships	**1+ year**	■ Creation of an integrated solution for the GMS/OAS system. The new solution will save maintenance costs in the long term, unify the document management and will be integrated with the finance. As being a crucial decision for REF this action will be implemented in one year approximately. *Depends on the chosen alternative*

28 ■ *Actions on agenda* ☐ *Actions to be discussed*

Action list was developed in order to create the IT Roadmap for REF (II/II)

Category	Duration	Description
Application upgrade	**1-3 month**	■ Introduction of O365 licensing. *Not yet decided.*
IT operation definition for REF Offices	**3 months**	■ Cooperation and support of REF IT to its foreign offices. 　■ IT service levels to be defined. 　■ Obligatory and Mandatory IT Applications to be defined for other REF offices. *IT services and support level is not yet defined for other offices.*
Hardware replacement	**Continuous activity**	■ Continuous replacement of hardware devices based on their age and condition.

Proposed IT roadmap combines all the defined action groups on a timeline

Year	2017						2018												2019	
Actions	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02

Expert level discussion

- IT Guidelines & Security
- Application upgrade and licensing
- Moving to the cloud
- New web presence

Concept discussion

- Integrated platform for grants and scholarships*
  Decision ◆ Selection → Implementation (Spec, Dev, Test, Go Live)
- IT operation definition for REF Offices

30 ■ *Actions on agenda* ■ *Actions to be discussed* *Schedule has to be defined after decision about alternatives.* © IFUA Nonprofit Partner

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The following next steps should be on REF's agenda about the IT

#.	Tasks	Proposed deadline
1	■ Decide about the alternative regarding the Grant and Scholarship integrated solution.	31.07.2017
2	■ Define IT policy and Security guidelines.	31.08.2017
3	■ Analyze the effect and relevance of GDPR for REF's operation.	31.08.2017
4	■ Preparation of cloud migration.	31.08.2017

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Steering Business
Successfully

Guiding questions to choose the appropriate vendor (I/II)

Company's general abilities

- Does the company have enough consultants and experience to carry out the task?
- Is the introduction and development separated (separate support, the support tasks are not done by the introductory team)?
- When can the company start the job (ensuring the availability of the team)?
- Is the company willing and capable to start the work prior the contract with a time and material-specific collateral?

Company's professional skills

- Are the system integration skills convincing? Do they have enough system integration experience?
- Does the company have enough experience with the hardware sizing with available specialists (external / internal)?
- Have the company introduced a software with a similar complexity in the last 3 to 5 years (in the number of transactions and system connections)?
- Do they have experience with contact management surfaces (also because of company size and complexity)?
- Does the company have experience with document management connection? Have they been able to present a solution?

Is the method of introduction appropriate?

- Is the methodology well documented?
- How much does the company estimate the time of requirement assessment? How will be these requests incorporated into the system?
- Is it properly iterative? Does it ensure the integration of the development / introduction requirements?

Guiding questions to choose the appropriate vendor (II/II)

Is project documentation correct?

- Will they create a User Manual?
- Will they create an operator documentation?
- Are the training materials separated from the user manual?
- Is there any additional / extra training material (e.g. video)?

Can the system be further developed?

- Is the documentation needed provided to further develop the system and to give it to another developer?

Grant Management Systems (Complex Application Review Needs)

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Source: A Consumers Guide to Grants Management Systems p.44-45