What to consider when going multilingual

The following document will outline at a high level, both the **technical** and **design** considerations, risks and finally recommendations in building a multilingual VA experience/ conversation.

Technical considerations:

Natural Language support (Text)

Translation

- Requires translating messages from English to the natural language
- Translation needs to be done by a human with translation qualification in the relevant language
- Software translation is not good enough for application and may produce weird message or message does not make sense
  - » Google translates “Please tell me the NMI of your property.” to “請告訴我你的財產的NMI。”
  - » The translation above in Chinese means “Please tell me the NMI of your belongings” which isn’t the original sentence.

Risks:

- Due to the limitations of software translation, the conversation from English to another language may result in incoherent messaging or mistranslation altogether
- There may be a high cost in having every single conversation translated by a human

Mainstream natural languages

- In general, mainstream natural languages are supported in computer natural language processing (NLP). Here is the list of mainstream language supported by a mainstream NLP software:
  - » English
  - » French
  - » Chinese
  - » Arabic
  - » German
  - » Spanish
- Although NLP supports most of the mainstream languages, some have better support than another’s. For example, NLP on English can tag “John” as a name but it can’t tag “Chloé” in French

Risks:

- Current NLP software may not be available for a language
- The amount of support NLP has for a language may vary from language to language

What to consider when going multilingual

Other natural languages (e.g. Vietnamese)

- Neural network model
  - » Needs to be built from scratch
  - » Requires a language expert and a computer NLP expert to work together
  - » Involves high cost and time; because of reasons above

Risks:

- Current NLP software may not be available for a language
- The amount of support NLP has for a language may vary from language to language

Natural Language support (Voice Recognition & Synthesis)

- Currently devices such as Google Home and Amazon speakers have natural language support on some mainstream languages.
- Voice recognition converts speech to text
- Voice synthesis converts text to speech
- Currently there is support on some mainstream languages. For example, on Google Home there is support for:
  - » English
  - » French
  - » German
  - » Japanese
- As of today, there is no support for minority languages such as Vietnamese on Google assistant, Siri and Alexa.

Risks:

- Current NLP software may not be available for a language
- The amount of support NLP has for a language may vary from language to language

What to consider when going multilingual

Hardware considerations

- Neural network models are big and loaded into computer memory
  - » Neural network models for English took up 2.5 GB memory
- The more languages the virtual assistant supports, the more memory is required on the server (a ballpark of 2 GB additional memory per language)
- The larger memory requirement may need hardware upgrade cost (for EA hosting services on their servers) or will increase running cost (for EA hosting on AWS)

Risks:
- Cost of hardware
- Running costs

Quality assurance consideration

- Fluency in the natural language
  - » It is important for testers to be familiar with the language they are testing on. For most people not knowing Chinese, the character "洒" and "酒" may be mistaken as the same word especially when there are hundreds of Chinese characters involved
  - » Testers need to understand the language for spotting out inconsistencies and suggest improvements in the conversation
  - » It is more difficult to employ testers fluency in more than one language. For languages in minority groups, it will be even more difficult
- Cost implications
  - » Each language version of a conversation is required to be test separately; thus, the testing time and effort will be higher compared with that of supporting only English
  - » The more languages supported in a conversation, the more likely additional testers will have to be employed to test each conversation
  - » It may be required to pay a "premium" to hire a tester fluent in a minority group language

Risks:
- Testers with fluency in a specific language may be difficult to find
- Cost of getting a tester that specialises in a specific language

What to consider when going multilingual

Design considerations:

Natural Language support (Conversation design)

Translation

- It requires translating the conversation from English.
  - » Native translators are far better than non-native translators - while a non-native translator knows many of a language's conventions, every language has odd idioms that can only be mastered and understood by native speakers.
  - » Native speakers and habitual users also know all the common colloquial phrases and how to use them. They're intimately familiar with the language's grammatical structure as well as the exceptions to the grammar rules.
  - » The language barrier is perhaps an even bigger issue than cultural limits; even single-language sites can run into this problem. For instance, you use an "elevator" in the US, but we use the "lift".
  - » Differing terminology is difficult enough in and of itself. When slang, non-verbal cues, and gestures are included, we add another layer of complexity.

Risks:

- Finding a specialist who's a native speaker in the language and also understands conversation design

Natural Language support (UI design)

Consideration should be given when designing the UI to account for the different languages.

- Varying designs to suit different languages won't be a viable solution - but a one size fits all approach will still be at the mercy of the language it displays and may not look and feel exactly as intended.
  - » Consideration should be given to how paragraphs, sentences and individual words may vary in how they are structured.
  - » Does it read left to right, right to left (or vertical in certain instances).
  - » Depending on the channel, there will be another level of complexity in making sure that the design is not compromised - mobile, desktop, tablet etc.
  - » Use of colour and what it represents may vary from culture to culture.
  - » The choice of font(s) is another important factor - legibility, style, is it formal or not etc. Understanding these nuances will be important.
  - » Maintaining the language of the design and staying true to the brand across multiple languages will be important.

Risks:

- Designing a structure that is malleable enough to incorporate the various languages and their structures, but also being aesthetically pleasing and functional and true to the brand.

Natural Language support (UX)

- Considering all of the above, it will be very important to understand the audience against the brand - taking into account culture, bias, likes, dislikes etc to get the user and the business meaningful outcomes.

What to consider when going multilingual

Recommendations:

The recommendation would be an iterative approach. Starting from English to build up the virtual assistant, it's experiences and services (i.e., support essential conversations such as apply concession).

Once the English version is mature, take these learnings, add one new language at a time, rinse and repeat.

The other languages should be prioritised based on EA's customer base and cost analysis.

This approach should give visibility on cost to implement and support another language and could be used as one of the pillars to evaluate EA's ROI in going multilingual.